AUGUST 17, 1935

Railway Age

FOUNDED IN 1856

97.5 Per Cent Solid Comfort

A VACATION traveler returning recently from a 6,000 mile Coast-to-Coast trip described one night of travel, "off the main line," on a 150 mile trip up into the mountains. "The heat in the non-air-conditioned car that evening," he said, "was almost unbearable; but before morning the cold mountain air was equally unbearable." This uncomfortable experience represented only 2.5 per cent of that traveler's journey, but it served to impress upon him, by contrast with the other 97.5 per cent, the great progress the railroads have made in providing air-conditioned trains from coast-to-coast.

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Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name registered U. S. Patent Office.

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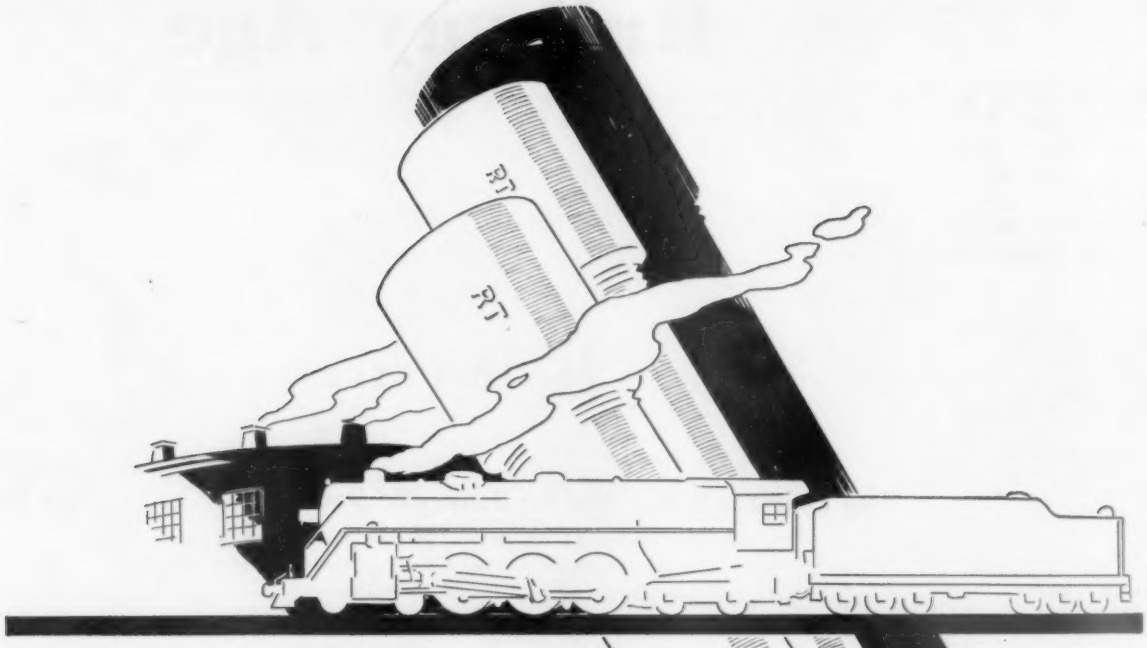
In This Issue

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service



Railroad service is different
But so is
TONCAN IRON PIPE

Railroad service with its sulphurous smoke, cinders, brine drippings and exposure to the elements is exceptionally severe on pipe. It calls for a pipe material that is different—a pipe that can render adequate service under punishment. » » » Toncan Iron Pipe is different because it is not one metal, but an alloy of three. To produce it, refined iron, copper and molybdenum meet in the fiery swirling heat of the open hearth furnace and alloy to produce rust-resisting material that holds first place among the ferrous metals in its price class. » » » That's why it's different—just as alloy steels are different from ordinary Bessemer and open hearth steels. And that's why it helps cut railroad pipe costs—because it lasts longer in service—demands less frequent replacement. » » » Republic also makes steel pipe—true, round, uniform in composition. Specify it where steel pipe will do. » » » » » » »

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RAILWAY AGE

Causes and Effects of $1,000,000,000 Decline of Annual Railway Purchases

In an editorial in its issue of August 10 the *Railway Age* emphasized at length that, in spite of all the agitation and legislation about "redistribution," the vital problem of all classes in the United States, and especially of the middle class and poor, is still that of increasing the national income and employment by increasing the production of both consumers' and durable goods. The principal purpose of this editorial is to show the extent to which reduced railway buying from the manufacturing industry has been and still is a cause of curtailment of production and employment; why railway buying has been and still is relatively so small; and what must be done to increase it to enable the railways to become an influence for instead of against economic recovery.

Railway financial results are ordinarily considered of importance only because they determine the interest and dividends that can be paid to security owners, and because widespread bankruptcy might lead to government ownership. They are hardly, or no, less important because of their effect upon railroad buying. Net operating income, the measure of financial results, is the amount of earnings left after paying operating expenses, taxes, and equipment and joint facility rentals. It is statistically demonstrable, that, over periods of years, and even almost year by year and month by month, net operating income determines the amount of railroad buying from the manufacturing industry. Almost nine-tenths of this is buying from manufacturers of durable goods. The durable goods industries are still much the most depressed. Therefore, their revival is the most essential to the complete revival of production and employment.

Net Operating Income and Railway Purchases

Railroad purchases from manufacturers increased in 1934, being twice as large as in either 1932 or 1933, and amounting to about $625,000,000. In 1935 they have again declined. They were stimulated last year by government loans and by an increase of net operating income in the first half of the year. They have since declined because net operating income has declined. Presumably, further government loans for purchases are available; but, directly or indirectly, they must ultimately be repaid from net operating income, and declining net operating income discourages borrowing for buying. Many railroads will borrow to avoid bankruptcy that will not borrow to make purchases. Railway purchases from manufacturers averaged $1,396,000,000 annually in the five years 1925-1929, inclusive. They averaged only $624,000,000 annually in the five years 1930-1934, an average annual reduction of $772,000,000. They are now running at an annual rate about $1,000,000,000 less than they averaged in 1925-1929.

Table I—Railway Net Operating Income and Purchases From Manufacturers

Year	Net Operating Income	Purchases from Manufacturers
1925	$1,138,632,320	$1,422,157,000
1926	1,233,003,087	1,529,104,000
1927	1,085,141,596	1,330,377,000
1928	1,194,487,806	1,253,992,000
1929	1,274,595,403	1,442,434,000
Total Five Years	$5,925,860,212	$6,978,064,000
1930	$885,011,325	$1,236,261,000
1931	531,095,961	615,912,000
1932	334,324,999	321,000,000
1933	474,369,438	319,500,000
1934	462,706,910	625,000,000
Total Five Years	$2,687,508,633	$3,117,673,000
Annual Average 1925-1929	$1,185,172,043	$1,395,613,000
Annual Average 1930-1934	$537,501,727	$623,535,000
Decline in Annual Average	$647,670,316	$772,078,000
Per Cent Decline in Annual Average	55	55
First half 1935	$194,812,659	$196,000,000

In Table I are given statistics showing the net operating income earned by the railways and the amount spent by them in making purchases from manufacturers in each of the ten years 1925-1934, inclusive. Statistics of aggregate net operating income and aggregate purchases for the five-year periods 1925-1929 and 1930-1934 also are given. The statistics are given in such

detail to prove factually and conclusively the dependence of purchases upon net operating income. Purchases in 1930 were artificially inflated by compliance with the request of President Hoover that capital expenditures be maintained, and in 1934 by government loans. In spite of these artificial influences, the declines in net operating income and in purchases from manufacturers in the five years 1930-1934, as compared with the five years 1925-1929, were relatively exactly the same, each being 55 per cent. This was not merely a coincidence. It was a case of cause and effect. Their artificial stimulation in 1930, in spite of a sharp reduction of net operating income, simply caused them to decline abnormally in later years when net operating income continued to decline. Their artificial stimulation by government loans in 1934 also soon lost its effect because of a decline in net operating income from $540,270,000 in the year ended June 30, 1934, to $413,916,000 in the year ended June 30, 1935. In the first one-half of 1935 net operating income was $195,000,000; purchases from manufacturers about $196,000,000. The Chesapeake & Ohio had the largest net operating income earned by any railway system excepting the Pennsylvania, and proportionately a much larger net than the Pennsylvania. It also ordered 5,125 of the 7,083 freight cars ordered in the first seven months of the year.

Railway Results in Second Quarter of 1933, 1934 and 1935

In view of this conclusive demonstration of the dependence of purchases upon net operating income, the financial results of the railways in the second quarter of 1935 are anything but encouraging. This was the first full quarter in which both the small advance in freight rates granted by the Interstate Commerce Commission, and wages restored to the pre-depression basis, were in effect. Comparative statistics for the second quarter of 1933, 1934 and 1935 are given in Table II. They show very strikingly what "recovery" has done for—or to—the railways. Following the banking crisis in March, 1933, the condition and trend of general business were assumed in Washington to be so bad that heroic governmental measures were required to save it; and the National Recovery Act and numerous other "recovery" measures were hurriedly enacted in June. In view of all the talk about what these measures would accomplish, or have accomplished, it is somewhat shocking to find that the railways earned more net operating income in the second quarter of 1933, immediately following the banking crisis, and before any of the "recovery" measures was in effect, than in the second quarter of either 1934 or 1935. Their net operating income in the second quarter of 1933 was over $120,000,000; in the second quarter of 1934, $114,000,000; in the second quarter of 1935, only $110,000,000. Gross earnings were larger than in either 1933 or 1934. Increase in operating expenses caused the decline of net operating income. They were $93,000,000 more in the second quarter of 1935 than in the second quarter of 1933, and $14,500,000 more than in 1934. This increase of operating expenses was due principally to advances in prices caused by NRA and to the advance in wages consummated on April 1, 1935. Total compensation of employees in the second quarter of 1935 was $82,000,000 larger than in the second quarter of 1933, which accounted for almost nine-tenths of the increase in operating expenses. Total compensation in the second quarter of 1935 was, in spite of a reduction of 40,000 in employees, and because of the advance in wages, about $29,000,000 larger in the second quarter of 1935 than in 1934. This was twice the total increase in total operating expenses, showing retrenchment in other expenditures. The downward trend of net operating income shown in the second quarter of 1935, in spite of a small advance in freight rates, is plainly adverse to an increase of railway buying.

Table II—Second Quarter, 1933, 1934 and 1935

	1933	1934	1935
Freight Car Loadings	7,095,005	7,854,683	7,665,376
Gross Earnings	$758,511,245	$830,224,744	$835,537,198
Operating Expenses	540,312,782	618,544,678	633,104,306
Salaries and Wages	337,951,428	382,999,257	412,260,133
Per Cent Salaries & Wages of Operating Expenses	62.5	61.9	65.1
Average Number of Employees	940,474	1,038,514	996,318
Average Compensation per Employee	$359.34	$368.80	$413.78
Taxes	$66,586,086	$64,214,646	$62,008,781
Uncollectible Revenues and Joint Facility Rents	31,407,754	33,294,528	30,385,012
Net Railway Operating Income	120,204,623	114,170,892	110,039,097

Duty of Government and Railway Managements

Can government and railway managements do their duty to the public without taking any action to improve current railway financial results for the express purpose of arresting the decline of railway buying from manufacturers, which is now again running at an annual rate almost 80 per cent less than it averaged in 1925-1929? When the railways buy equipment, materials and supplies they afford business and power of employment, not only directly to the manufacturers from whom the purchases are made, but to other manufacturers from whom these manufacturers buy, and to producers of ore in the Lake Superior region, of lumber in the Southwest and Northwest and of fuel throughout the country. The effects of a reduction of $1,000,000,000 annually in their purchases from manufacturers below the 1925-1929 average ramify into every section and into innumerable communities. Disregarding its arresting of railway improvement and causing of deterioration of railway property, it has the immediate and current effect of seriously retarding national economic recovery and re-employment. There are about 700,000 railway employees out of work; but the amount of unemployment being caused by curtailment of railway purchases from manufacturers probably is substantially larger than this.

The reduction of railway net operating income and, consequently, of railway buying, is due to several causes. Car loadings in the second quarter and also in the first half of 1935 were smaller than in 1934. In

July they were smaller than in either 1933 or 1934. This was principally due to the condition of general business, and especially to lack of production in the durable goods industries. Since the middle of July car loadings have shown an upward trend. The improvement in general business which this and other developments indicate has begun probably is principally due to the decision of the Supreme Court in the NRA case, which destroyed one of the government's principal policies that were hindering recovery. There seems reason for hoping that it will continue in spite of other government policies that will exert an adverse influence in future. The legislation for regulation of motor carriers will tend to increase railway traffic and earnings, as would the passage also of proposed legislation for repeal of the long-and-short-haul section of the Interstate Commerce Act and for the regulation of water carriers. But net operating income is being curtailed by excessive operating costs as well as by lack of traffic; and no increase of traffic is occurring or in early prospect that is sufficient to justify continuance of present operating costs.

Where the Responsibility Lies

The principal cause of the increase in operating expenses is, of course, the advance in wages consummated on April 1. By increasing the average pay of railway employees it both reduces the number of such employees—which was 40,000 less in the second quarter of 1935 than in the second quarter of 1934—and curtails net operating income and thereby purchases. It thus tends to delay increased production, which would contribute toward the revival of general business and thereby toward increased railway traffic, earnings and buying power.

It may appear that the entire responsibility for trying to bring railway operating costs into line with gross earnings, in order that the solvency of the railway industry may be assured, and that by increased buying it may contribute toward economic recovery, rests upon railway executives. This is not the case. The policies of government and other industries under NRA caused the advances in prices that the railways have to pay for materials and fuel; and the Guffey coal bill would further increase their fuel costs. Railway managers agreed to the advance in wages, and have taken no steps toward getting it rescinded, largely because of fear that in case of a serious wage dispute an administration apparently committed to high wages regardless of their larger economic consequences would give at least its moral support to the railway labor unions. But is it certain this would be the case if the adverse influence upon railway buying and national recovery exerted by the present trend of net operating income were made clear to the administration?

A National and Public Problem

The problem presented is a railroad problem, because every day an increase of railroad buying is delayed the railroad plant deteriorates from lack, not merely of improvement, but of adequate maintenance. It is a problem of all industry and of the public, because every day an increase of railroad buying is delayed subnormal production, unemployment and expenditures for relief are protracted proportionately. It is a problem and responsibility of government, because government policies are largely responsible for the curtailed traffic and gross earnings and increased expenses that have prevented the large increase in railway buying that would have occurred if net operating income had continued to increase as it already was greatly increasing in the second quarter of 1933 owing to the improvement in general business and increase in traffic that had then begun. It is a responsibility of government because Congress is now considering pension and other legislation which, by further increasing railway expenses, would tend to still further curtail railway net operating income and buying power, and thereby to protract depression and unemployment.

It is the duty of railway management to do all it can to promote recovery by doing all it can to bring operating expenses into line with gross earnings, and thereby increase railway buying power; but the railways can contribute little or nothing toward recovery as long as government policies hinder or prevent increases in their gross earnings, or reductions of their operating expenses, or both, with the result of curtailing the net operating income which determines how much the railways can, by their purchases from the manufacturing industry, contribute toward the volume of production. While the problem presented is a *national and public problem*, not merely a railroad problem, the initiative in trying to solve it, and in elucidating it and bringing it forcibly to the attention of the public and the federal government, plainly should be taken by the railway managements and manufacturers that best understand it and are most directly concerned with it.

"Labor" Explains Why 40,000 Employees Lost Their Jobs

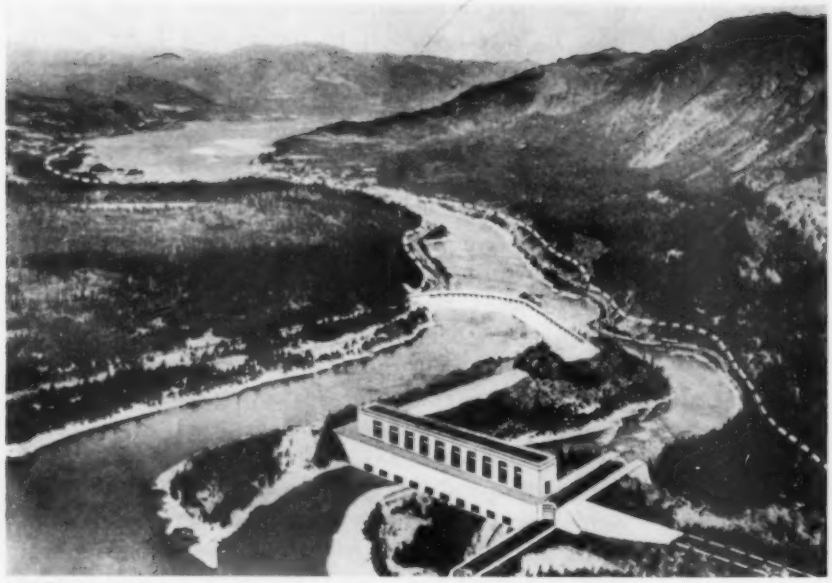
"Rail Jobs Decline, Wages Are Higher.—A dismal picture of employment conditions on railroads was painted this week by the Interstate Commerce Commission.

"The number of jobs in May, it said, had dropped 40,030 under the total for the same month last year, while those employed worked 3.81 percent less hours.

"A brighter side is the disclosure that, in spite of smaller working forces, wage payments were 7.07 percent higher than a year ago.

"This, the commission said, resulted from the restoration of the 10 percent pay deduction through the efforts of the Standard Railroad Labor Organizations."

—*From "Labor" (publication of the Railway Labor Organizations)*



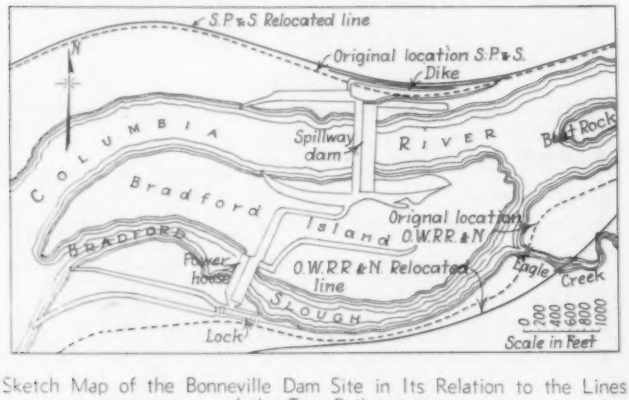
Aerial View of the Bonneville Dam from the West, with Artists Sketch of Completed Powerhouse—O. W. R. R. & N. Occupies Oregon Side of the River, on the Right and S. P. & S. Occupies the Opposite Bank

Acme Photo

Two Railroads Make Way for Bonneville Dam

Five miles of Spokane, Portland & Seattle and four miles of the Oregon-Washington Railroad & Navigation Co. tracks are affected by Columbia River project

EXTENSIVE revisions of the grades and alinements of two railways have been made necessary by the power and navigation project which the government has undertaken on the Columbia river at Bonneville, Ore., 39 miles east of Portland. The raising of the river level 65 ft. or more at this point requires the relocation of portions of the single-track main lines of the Oregon-Washington Railroad & Navigation Co., and the Spokane, Portland & Seattle in order to place the lines at a safe distance above the back-water curve. On the O.-W. R. R. & N. the maximum raise in grade amounts to 35 ft., which has necessitated grade and line revisions involving 4.26 miles of main-line track, while on the S. P. & S., the maximum grade raise required is 7 ft.



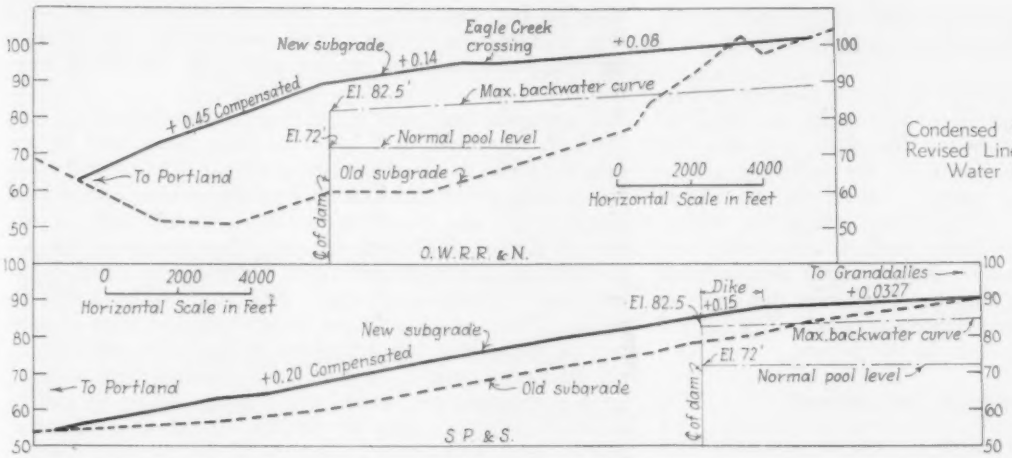
Sketch Map of the Bonneville Dam Site in Its Relation to the Lines of the Two Railways

and the main line trackage involved in the grade and line change amounts to approximately 5 miles.

In the vicinity of Bonneville the Columbia river occupies the deep and rugged gorge which it has cut squarely through the Cascade Mountain range in making its way from the "Inland Empire" to the Pacific ocean. In taking advantage of the natural east and west route thus afforded through these mountains, the O.-W. R. R. & N. was located along the south bank of the river while the S. P. & S. was built along the north or Washington bank, the center of the river in this vicinity marking the boundary between the states of Washington and Oregon. Both of these lines comprise important links in transcontinental systems, the S. P. & S. being controlled jointly by the Great Northern and the Northern Pacific and the O.-W. R. R. & N. being a unit in the Union Pacific System.

Water Level and Flow Data

The normal pool elevation of the water behind the Bonneville dam will be 72 ft. above sea level, or about 65 ft. above what has been the normal low-water stage at this point. However during heavy flows in the river the water may be permitted to rise to an elevation of 82½ ft. at the dam in order to balance the tailwater, and the back-water curve for this elevation, involving a flow of about 800,000 cu. ft. per sec., is considered the controlling factor in the raising of the railroad lines. For flows in excess of 800,000 c.f.s., the elevation of the water will be controlled by opening the spillway gates which, when fully opened,



Condensed Profiles of the Original and Revised Lines in Their Relation to the Water Levels Behind the Dam

will permit a flow of 1,600,000 c.f.s. However, the probability of such a flow is exceedingly remote.

The pool formed by the dam will extend about 50 miles upstream (eastward). At The Dalles, Ore., which is about 45 miles upstream from the dam, the impounding of the water will raise the level of the river about 28 ft. However, all but a relatively small part of the railway mileage upstream from the dam lies at an elevation well above the back-water curve, although where the water encroaches on the embankments, the latter are to be protected against wave action and erosion by riprap, and all culverts and drainage openings in which the discharge ends fall below the new water level must be replaced with openings of equal area at elevations where they will discharge at the normal pool level.

The railroad elevation and relocation problems at the dam site involve widely differing conditions. The line of the S. P. & S. through the Columbia River gorge was constructed in 1906-7, or subsequent to the record flood of 1894, when a flow of 1,170,000 c.f.s in the river was recorded. This compares with a mean flow of 211,000 c.f.s., which is based on records compiled over a continuous period of 55 years. While flows equal to that reached in 1894 are not expected to occur more than once in 500 years, memory of that flood was still fresh at the time the S. P. & S. was constructed through the gorge; and a grade line was adopted that provided a minimum free-board of 9 ft. between the subgrade and the elevation reached by the water during the record flow. At this elevation, allowing a minimum free-board of 5 ft., the construction of the dam made it necessary to raise the line a maximum of only 7 ft.

The O.-W. R. R. & N., on the other hand, was built through the gorge in 1880, or prior to the record flow of 1894. Therefore, in the absence of data pointing to the probability of such high flood stages, this line was constructed at a much lower elevation than the S. P. & S., with the result that the maximum raise required by the construction of the dam, allowing a minimum free-board of 7½ ft., amounts to 35 ft. Owing partly, therefore, to the greater raise required and in some measure to peculiarities in the topographical and geological conditions on the Oregon side of the river, the raising of the track of the Union Pacific unit presented a more complex engineering problem than was encountered by the S. P. & S.

A description of the more important aspects of the relocation problem encountered on the O.-W. R. R. & N. is given below, followed by a similar account of the raising of the S. P. & S.

Relocation of the O.-W. R. R. & N.

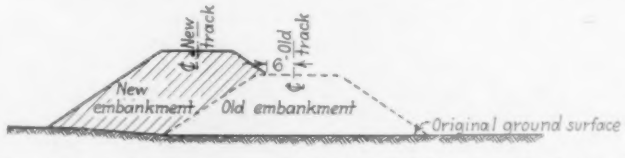
The 35-ft. raise in the O.-W. R. R. & N. grade at the dam site necessitated a runoff for about 2 miles to the west, or downstream, on a 0.45 per cent grade before connection could be made with the old grade. To the east, or upstream, the new grade follows the contour of the back-water curve, with a minimum free-board of 7½ ft., for a similar distance before connecting with the existing grade. The necessary support for the revised grade was obtained by shifting the line back from the river for varying distances, depending on the topography encountered, so that the location was revised for practically the entire length of the change of grade.

Advantage has been taken of the opportunity offered by the relocation project to improve the physical characteristics of the line in this vicinity, with the result that the line has been shortened 660 ft., the maximum grade has been reduced from 1.4 per cent to 0.45 per cent, the total rise and fall has been decreased 36 ft., the maximum degree of curvature has been reduced from 9 deg. 30 min. to 3 deg., and a total of 184 deg. 19 min. of central angle has been eliminated.

Principal Features

The principal structural features of the project include a reinforced concrete double-track, filled-spandrel arch viaduct, 900 ft. long and 50 ft. high at the highest point, which will carry the line across the mouth of Tanner creek; a double-track through-truss steel bridge across Eagle creek, embodying two 168-ft. steel through truss spans on concrete abutments and a pier, and a double-track concrete-lined tunnel 560 ft. long.

The arch structure embodies sixteen 56-ft. spans and is constructed on a 3-deg. horizontal curve. As the flats at the mouth of Tanner creek, which is on the downstream side of the dam, are occupied by the Oregon state fish hatchery at Bonneville the long arch structure was chosen for this location in preference to a shorter



Typical Cross Section Showing the Manner of Providing the Raise of Grade on the S. P. & S.

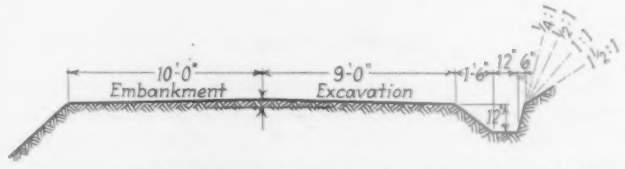


Diagram of Roadbed Standards for the Relocation of the O. W. R. R. & N.

structure with embankment approaches, in order to afford a minimum of interference with the hatchery facilities.

The bridge at Eagle creek will carry the line across the stream at an elevation 50 ft. above the present level of the water. However, when the dam is closed the water will rise to within 23 ft. of the subgrade at the bridge and during flood stages it may rise to within 10 ft. of the subgrade. Therefore, while the superstructure of the bridge is being built to carry only one track, a substructure capable of carrying a double-track bridge is being placed at this time to avoid the expense of sinking piers in 25 ft. or more of water if a second track should become necessary in the future.

Extensive Landslide Encountered

One of the most interesting aspects of the relocation project is the problem of stabilizing what is known as the Ruckel landslide. This slide covers a crescent-shaped area on the slope of the gorge, which extends from a short distance above Eagle creek to a point near the town of Cascade Locks, about 1½ miles. It has a maximum width of about 3,000 ft. and extends up the slope from the river to an elevation of about 600 ft. Having been a source of difficulty at times on the present line of the O.-W. R. R. & N., it was deemed important to take the necessary steps to insure that it would not cause trouble to the new line which crosses it at a higher elevation. Movements of the unstable area have not taken the form of extensive and dangerous slides but have been local in character, ordinarily occurring during the rainy season.

Although the present Ruckel slide involves the movement of material on the south side of the river it is supposed to have its origin in a prehistoric slide which occurred on the opposite side of the gorge. The original slide, it is believed, caused the gorge to be filled to a depth of 250 or 300 ft. where the toe of the slide came to rest against the foot of the basaltic cliffs that form the south wall of the gorge, thus forcing the river to cut a new channel through the slide material along the base of the south wall. The theory is that, owing to the curve formed by the diverted channel, the river gradually undercut its southerly bank, thus starting the slide which is now being dealt with.

Originally it was assumed that the mass of the slide was moving on a lubricated plane of solid material. However, an extensive subsoil survey, involving the sinking of about 9,000 lin. ft. of test holes by core-drilling and about 400 ft. by open-pit excavation, which was undertaken for the purpose of determining the position of the plane, failed to disclose any information to support the theory that such a plane exists. The borings showed that the material in the slide is composed of an agglomerate of broken rock and what is known as Eagle Creek formation, the latter having a tufaceous matrix, together with large pockets of basaltic talus from the cliffs above. These materials comprise an unstable mixture, the instability of which is aggravated by the seepage of water into the talus pockets during the rainy season, which water eventually seeks an outlet through pervious strata. The average annual rainfall in this district amounts to about 80 in.

Remedial Measures

In an attempt to stabilize the slide, the railroad had applied riprap along its face and had also constructed a series of drainage tunnels into the unstable material. While the latter remedy was not applied on an extensive scale, it has been quite effective locally. The plan adopted for stabilizing the slide in connection with the line change also involves the construction of drainage tunnels, but on a much greater scale than attempted heretofore.

During the past year three timber-shored tunnels, 4 ft. by 6 ft. in section and 1,000 ft. long, have been driven into the slide on an ascending grade of 0.5 per cent from the portals which are located just above the normal pool elevation of the reservoir. These tunnels will be observed during the rainy season preparatory to the inauguration of a more extensive tunneling program in an attempt to create a relatively dry zone about 1,000 ft. wide. The new tunnels are to be driven in such a manner as to tap the water pockets in the slide and thereby afford a ready outlet for the accumulated water. Heavy-gage corrugated perforated metal pipes are to be laid in the tunnels as a means of facilitating the flow of water and of adding to the permanency of the tunnels. Corrugated metal pipe is being chosen for this purpose because of its flexibility and the consequent ability to adjust itself to movements in the mass without obstructing the flow of water.

Dike Also to be Constructed

Another measure that is to be undertaken as a means of stabilizing the slide involves the construction of a heavy dike or toe wall of large riprap along the base of the slide. This dike, which is to be founded on solid rock, is to extend above maximum high water. Additional weight is to be given to the dike by back-filling the depression behind it on a slope reaching up to the railroad grade. Thus, the dike will not only prevent further erosion along the foot of the slide but will increase the resistance of the toe of the slide against pressure from above. It is estimated that the slide control measures will require from 6,000 to 10,000 ft. of tunnels, 700,000 cu. yd. of riprap and about 200,000 cu. yd. of backfill.

An element of uncertainty has been injected into the slide problem by the higher level of the water that will prevail at the foot of the slide. While the increased height of the water will raise the level of saturation in the slide, it is felt that, on the other hand, it will serve to balance the hydrostatic head of the water in any untapped pockets that may remain in the slide below the new water level.

Work on the relocation of the O.-W. R. R. & N. has been under way since the fall of 1934, and it is expected that the line change will be completed well in advance of the filling of the pool late in 1937. A contract involving a portion of the relocation work was awarded to Orino, Bell & Malcom, Portland, on September 25, 1934, while a second contract was let to Sam Orino and Associates on June 11, 1935. Additional contracts will be awarded as the work progresses. The relocation of this line will involve a total expenditure of about $5,000,000.

Five Miles Affected on S. P. & S.

On the S. P. & S. the grade and line changes necessitated by the construction of the dam were relatively simple. However, the project is distinctive by reason of the unusual limitations as to runoff grades that were imposed in developing the grade revision, namely, a grade of only 0.2 per cent to the west and substantially a level line to the east. This was done to avoid the introduction of grades in excess of those in a line of exceptional characteristics, for in a distance of 240 miles east from Portland there are no grades in excess of 0.2 per cent opposing eastbound movements, while for a distance of 348 miles there are no grades at all opposing

westbound movements. The maximum rate of curvature is three degrees.

In the downstream direction the 7-ft. raise in the grade at the dam required a runoff of about 3½ miles on a 0.2 per cent grade before a connection could be made with the original grade. In the upstream direction, allowing a minimum free-board of 5 ft., the new grade line (0.0327 per cent) follows the back-water curve for 1½ miles before intersecting the original grade. For a distance of 1,600 ft. upstream from the dam, the railroad's tracks are protected by a dike, the top of which is 9.5 ft. above the maximum pool elevation at the dam. Within this distance, therefore, it was not necessary to observe the minimum free-board rule in establishing the grade line except in so far as the grade was influenced by the necessity of attaining the 5-ft. free-board at the upstream end of the dike.

At the dam it was necessary to move the railroad line back from the river a maximum distance of about 150 ft. in order to provide adequate space for the construction of the dam and the dike. Elsewhere throughout the length of line affected by the grade revision the line was moved in a northerly direction only as far as was necessary to permit the grading to be carried out without interfering with traffic over the old line. Therefore, with the exception of about 4,000 ft. in the vicinity of the dam, the new line is generally parallel to the old alinement, the maximum distance between the two lines being 27 ft. This project also involved the relocation of the passing track and other sidings of the railroad at North Bonneville which is located at the dam site.

One Important Waterway

The only important waterway involved in the line change is Hamilton creek over which the old line was carried by means of a 150-ft. through-truss span on concrete piers and abutments. In providing a crossing over this stream for the new line, the superstructure of the existing bridge was transferred bodily from its original location to the new alinement, the substructure in the new location, including concrete U-abutments and a center pier, having been constructed previously. The shifting of the 150-ft. truss span, weighing about 200 tons, required a movement of 27 ft. in a northerly direction, 30 ft. easterly and 8 ft. vertically. During the transfer of the bridge, which was accomplished in less than five hours, traffic was handled over the relocated line, being carried across Hamilton creek on a temporary timber trestle. In addition to the old truss span, a new 60-ft. girder span was installed in the new alinement at the Hamilton Creek crossing.

The principal quantities involved in the relocation and raising of the S. P. & S. line included 450,000 cu. yd. of common excavation, 6,000 cu. yd. of medium excavation, 28,000 cu. yd. of solid rock excavation and 20,000,000 station-yards of overhaul. A contract for the project was awarded by the government to P. L. Crooks & Co., Portland, who started the work on June 13, 1934. The completion of all important work in connection with the line change and the diversion of traffic to the new line was signalized by the shifting of the Hamilton Creek structure from the old to the new alinement early in April, 1935.

All railroad work required in connection with the Bonneville power-navigation project was considered an integral part of the parent project and was carried out under the direction of the Corps of Engineers, United States Army. The railroad work was directed by A. E. McKennett, senior engineer, under C. I. Grimm, head engineer of the project, Major C. F. Williams, district engineer and Colonel Thomas M. Robins, division engineer at Portland. We are indebted to Mr. McKennett for the information contained herein pertaining to the relocation of the O.-W. R. R. & N., and to F. Mears, assistant chief engineer of the Great Northern, and A. J. Witchel, secretary and assistant superintendent of the S. P. & S., for the data concerning the changes made on the S. P. & S.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended August 3 totaled 597,083 cars, an increase of 621 cars as compared with the week before but a reduction of 15,577 cars as compared with the corresponding week of last year and of 23,399 cars as compared with 1933. Miscellaneous freight, forest products, and ore showed increases as compared with last year. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

Revenue Freight Car Loading

For Week Ended Saturday, August 3

Districts	1935	1934	1933
Eastern	133,607	130,266	138,059
Allegheny	113,648	112,614	129,245
Pocahontas	38,872	39,097	49,277
Southern	80,575	82,573	83,813
Northwestern	90,375	96,968	89,873
Central Western	91,931	99,825	84,218
Southwestern	48,075	51,317	45,997
Total Western Districts	230,381	248,110	220,088
Total All Roads	597,083	612,660	620,482
Commodities			
Grain and grain products	41,730	42,835	29,657
Live stock	9,528	27,746	15,048
Coal	91,992	100,187	116,800
Coke	5,177	4,735	6,788
Forest Products	29,258	21,509	27,934
Ore	33,004	30,170	31,563
Merchandise L.C.L.	158,918	159,918	173,332
Miscellaneous	227,476	225,560	219,360
August 3	597,083	612,660	620,482
July 27	596,462	610,042	644,839
July 20	593,366	616,040	656,380
July 13	566,488	604,192	653,661
July 6	472,421	520,741	543,510
Cumulative Total, 31 Weeks	18,001,877	18,400,298	16,463,172

The freight car surplus for the first two weeks in July averaged 317,212 cars, an increase of 45,585 cars as compared with the number in the last half of June. The total included 180,691 box cars, 90,019 coal cars, 28,312 stock cars, and 6,625 refrigerator cars.

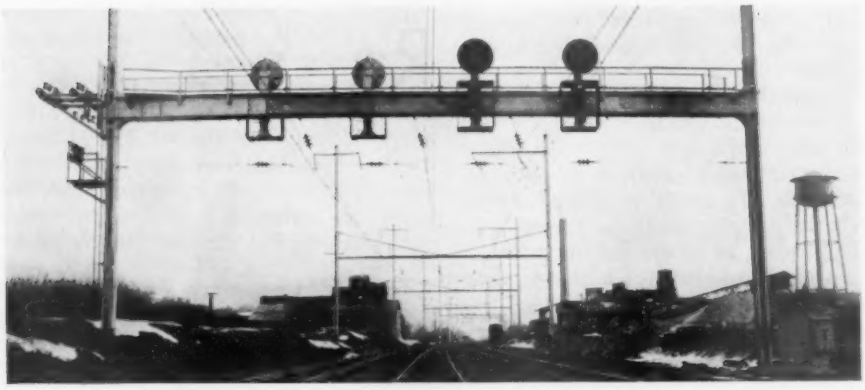
Car Loading in Canada

Car loadings in Canada for the week ended August 3 totaled 41,689, 487 cars less than in the corresponding week last year and 1,653 cars less than the previous week, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
August 3, 1935	41,689	19,457
July 27, 1935	43,342	18,458
July 20, 1935	45,294	19,364
August 4, 1934	42,176	19,477
Cumulative Totals for Canada:		
August 3, 1935	1,329,813	673,459
August 4, 1934	1,310,808	698,974
August 5, 1933	1,094,887	558,647

Coded Track-Circuit Signaling on the Pennsylvania

New system controls wayside automatic signals as well as cab signals without the use of line wires



Block Signal Bridge in Three-Track Territory. Middle Track Signaled for Both Directions

INCIDENT to the electrification of its line between Wilmington, Del., and Washington, D. C., the Pennsylvania not only rearranged the automatic block signal system, using position-light signals spaced for maximum train speeds of 90 miles an hour, but also provided a new coded track-circuit system of control, by means of which the wayside signals, as well as the continuously-controlled cab signals, are controlled without the use of line wires. Other special advantages of the new system are the protection provided against foreign current, as well as defective insulation in rail joints.

This new system of control was developed on the Pennsylvania and has been tested in regular service on short sections of track for more than two years, but the Wilmington-Washington project is the first extensive installation to be placed in service. With the completion of this project in April of this year, the Pennsylvania is equipped for the electrical operation of trains between New York and Washington, the entire territory being provided with modern position-light wayside automatic signals and cab signaling.

The line between Wilmington and Washington, 109 miles, consists of sections of two, three and four-track railroad, including 314 track miles of signaled main line. Of this mileage, 18 track miles are signaled for either-direction train operation, as, for example, between Ragan and Davis where the center track on 9.1 miles of three-track road is signaled for either-direction operation while each of the two outside tracks is signaled for one direction.

An interlocking is provided at each of the junctions where the number of tracks changes, a total of 27 interlockings being included in this territory. At some of these plants the turnouts and crossovers were changed to accommodate higher train speeds, thus requiring changes in the interlockings and respacing of the home and distant signals.

The signaling system was replaced practically in its entirety. All semaphores were discarded, but where position-light signals were previously in service, they were rehabilitated and used in other locations, so that position-light signals are now provided not only for automatic blocks but also for interlocking signals.

In the new arrangement, the automatic blocks average 8,000 ft. long, with some variations to adjust for overall distances between interlockings. This spacing is based on maximum train speeds of 90 m.p.h., using three-aspect, two-block signaling. The intermediate automatic block signals are mounted on the new beam bridges which form a part of the "H" structure for supporting the catenary and for carrying the high-voltage power-distribution circuits for propulsion current and for signal supply. At interlockings, the home signals are mounted on heavy anchor-type bridges which act as anchors for the catenary.

As the propulsion current is 25 cycle, it was necessary to use a different frequency for the signal track circuits in order to prevent any interference. Therefore, 100-cycle current was adopted for the track circuits which, of course, necessitated an entirely new 100-cycle power system for the signaling, separate from the propulsion power supply system. The track circuits are of the double-rail type, using impedance bonds.

Feature of Code System

The coded track-circuit control system is an adaptation of the continuously-controlled coded cab-signaling system which has been used quite extensively on the Pennsylvania for several years, but on the installations in service prior to the Wilmington-Washington project, a continuously-flowing current was used on the track circuit to control the wayside signals. In the new adaptation of the code control system, the coded impulses formerly used for the control of the cab signaling only, are now used also for the control of the wayside signals, thus eliminating the extra provisions for a separate cir-

cuit, and, of greater importance, eliminating the need for line control circuits, except in the vicinity of interlockings.

Interrupted 100-cycle energy is fed to the track circuit through the code transmitter. This instrument, which operates continuously, includes a synchronous motor, driving a set of gears which operate a shaft at 15 r.p.m. On this shaft is a set of two or three cams, each with a different number of equally-spaced depressions in the periphery. Each contact-operating arm bears on one of the cams, and thereby regulates the frequency of impulses transmitted. An impulse frequency of 180 per minute is transmitted to control a "clear" aspect, with 75 for "approach" and, when used, 120 for the "approach restricting" aspect.

The selection of the code cycles to be sent out at the feed end of a track circuit, to control the respective aspects of the signal in the rear, is effected by circuits controlled through relays. Code cycles at the rate of 75 per minute are fed to the track transformer and out over the track circuit to the rear when the block protected by a signal is occupied; in other words, when the code-following relay ceases to operate. Under this condition, the wayside signal indicates "stop and then proceed" but nevertheless the 75 code cycle must be sent out on the track circuit to the rear to cause the signal in the rear to display an "approach" aspect, and, likewise to cause the cab signal on an approaching locomotive to give an "approach" indication while a train is in the block approaching a wayside signal indicating "stop and then proceed." When the wayside signal under discussion displays the caution aspect, 180 code cycles are sent out over the track circuit to the rear to control the signal in the rear to the "clear" aspect.

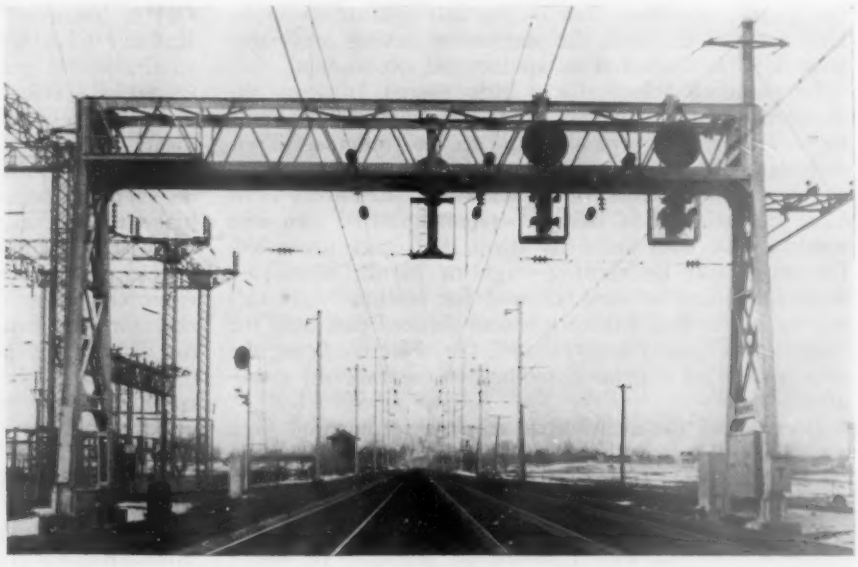
Regulation of the 100-cycle current used for feeding the code impulses to each track circuit is accomplished by a transformer and a reactive impedance. The normal voltage of the 100-cycle current on the rails at the feed end ranges from 2 to 10 volts. In order to provide for proper operation of the cab signaling, the track-circuit feed is adjusted to provide about 2.0 amp. minimum axle current, this being the reading when a train first occupies the entering end of the track circuit. This current increases as the train proceeds toward the feed end, the current, of course, being limited by means of the reactive impedance.

On an approaching locomotive, the codes are picked up inductively by the receiving apparatus and are then amplified, decoded, and utilized in the usual manner to control the cab signals. These same code impulses on the rails are used also to control the wayside signals. This result is accomplished by using apparatus of the same general character as that on a locomotive, except that, in the case of the wayside signals, the code impulses need not be picked up inductively but are conducted from the rails at the receiving end of the track circuit by wire connections to a resonate transformer unit which, through a rectifier, feeds the code-following track relay, which picks up and drops for each interruption of the code, thus being constantly in operation except when the track circuit is occupied. Circuits through the contacts of this relay control other relays, which include certain checking features and control the aspects of the signal as well as the feed to the track circuit in the rear. The checking feature prevents improper operation in case insulation is broken down in an insulated rail joint or in case a steady flowing foreign current is received.

Use of Cut Sections and Crossing Signal Control

In some instances the track circuits extend the full length of an automatic block, but where the block is more than 6,000 ft. long, or where highway crossing signals are involved, cut-sections are required. At a cut-section, the code-following track relay of the first track circuit merely codes the track-circuit energy feed to the second section. The code-following relay opens and closes according to the number of code cycles being received. Therefore, the second front contact of the relay is used to repeat the number of code cycles to the transformer which feeds the track section to the rear.

Where a highway crossing signal is located in a block in coded track-circuit control territory, a cut section is required, as usual, so that the operation of the highway crossing signal will be stopped after a train has passed the crossing. The track circuit in the rear of the cut-section is supplied with energy which will not give a proceed indication. One means of controlling the highway crossing signal is to feed steady energy to the portion of the block in the rear of the cut-section while the train occupies that portion of the block ahead of the cut. Steady energy will pick up the code-following track relay at the entrance to the block when the train clears the cut-section and will hold the front contact continuously closed. The steadily energized code-following track relay will continue to hold the wayside signal at the en-



Home-Signal Bridge at Davis Interlocking on Three-Track Territory

trance to the block at "stop and proceed," the same as obtained with a steadily de-energized relay.

Steady energy is used in this manner merely to guarantee that a definite section of track is unoccupied, even though the remaining portion of the block may be occupied. This affords a very simple means of operating highway crossing signals in the coded track-circuit control system by what is called "steady-energy" track circuit detection.

A considerable number of the street and highway crossings in this territory were already protected by standard flashing-light crossing signals, and in rearranging the signaling, either a cut-section or a signal was located at each crossing not now protected so that minimum expense will be occasioned in case it is necessary to install an automatically-controlled crossing signal at any of these locations.

The coded system of control for wayside and cab signaling described in this article was developed through the co-operation of representatives of the signal department of the Pennsylvania and the Union Switch & Signal Company, the wayside signals, relays and other instruments, as well as the cab-signal apparatus, having been furnished by the Union Company.

Railway Employees Are Interested in Self-Improvement

By William S. Wollner

EDUCATIONAL institutes are not uncommon in many lines of industry, notable ones being in the banking, stock brokerage, and insurance fields. In an address to the New York Railroad Club in 1920 on The Human Element in Railroading (see *Railway Age*, October 22, 1920, page 691), the author advocated employee education as a responsibility of management, but no effort was made to adopt this suggestion.

During the summer of 1934 the Pacific Railway Cub conducted an essay contest among younger Pacific Coast railroadmen (see *Railway Age*, September 1, 1934), the response to which suggested that the time was ripe for experimentation in employee educational activities. Executives of Pacific Coast roads were quick to authorize this experiment and to agree to bear the expense. As the Pacific Railway Club is the only institution of its kind west of Chicago, the suggestion having originated with it, it was selected to conduct the experiment.

In planning this Railway Educational Institute the director laid down the following principles: There must be no fee or charge of any kind to the students. Time and place of sessions must interfere in the least possible manner with students' other activities. Lecturers must come from the roads' official personnel and be men who would speak with authority upon the topics presented. Lectures must be short enough to permit discussion within the limit of time allowed for sessions. As this was to be the first Institute it was planned that only the "high lights" could be presented, the objective being the presentation of a general picture of the railroad structure.

Because of the belief that employee education is a management responsibility, and because there had been abortive attempts to induce employees to enroll in educational and other courses where fees were assessed against them, it was deemed essential that the entire expense of this Railway Educational Institute be borne by the roads. Fortunately, the auditorium of the Pacific Gas and Electric Company was made available through the courtesy of that company, providing a hall of adequate capacity and located within a few minutes walk of railroad general offices and commuter terminals. By starting sessions at 5:10 and dismissing students at 5:50 they lost no time from work and arrived at their homes very little later than usual.

The reservoir of available material from which lecturers might be drawn made it a simple matter to secure the type of men desired. However, so that students might have the opportunity of listening to especially qualified men, two sessions were addressed by men from outside the officer personnel. These were a college professor and a state railroad commissioner, both especially qualified in the topics presented.

In arranging the programs it was borne in mind that the average employee knows very little of the functioning of departments other than his own, and in the larger departments only such things as come under his direct observation. The eight railway officers included two presidents, an assistant to the president, an auditor, a mechanical engineer, a supervisor of transportation, a general storekeeper, and an assistant general freight agent. They were from four different companies.

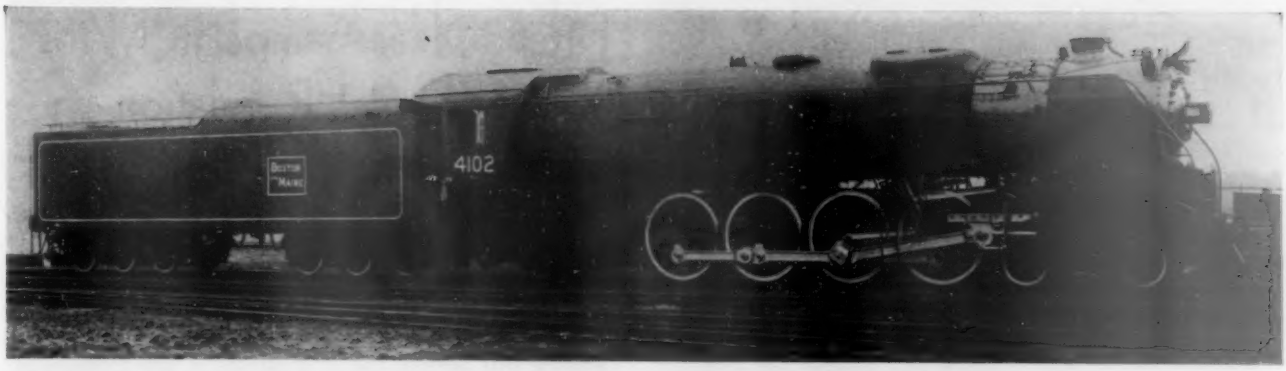
With a total enrollment for the course of 837, the average attendance at the ten Tuesday evening sessions was 669. Topics presented were: Railway organization; railway statistics; rates and tariffs; railway accounting; the transportation department; motive power; engineering and maintenance; railway finance; purchasing storage and use of material; unfair competition and how to meet it. Eight of the topics were presented by officials connected with the departments concerned; engineering and maintenance was presented by Francis S. Foote, professor of railway engineering at the University of California, and unfair competition and how to meet it, by Wallace L. Ware, railroad commissioner of the State of California.

A questionnaire was mailed to all students upon the completion of the course, in answer to which ninety-seven per cent of those who replied stated that they would attend another Institute if one was held in 1935. Fifty-six per cent of those who replied stated that they would participate in a course of public speaking for railroadmen for which students would be charged a fee.

The expense to the railroads for this Institute was but eleven cents per enrollment, but it must be remembered that there was no rental charge for the hall, no fees to lecturers, that the plant and facilities of Pacific Railway Club were availed of for all preparatory and routine work, and that the Educational Director volunteered his services.

The success of this Railway Educational Institute indicates that employees are very willing to avail themselves of educational opportunities when permitted to do so and that perhaps management has been slow to make these available. Also, and this is borne out by the essay contest as well as the Institute, that there is a field for railway club activity that has been but little explored. The experiment also demonstrated that, if necessary, educational effort may be carried on with the use of only the roads' officers, thus improving employee-officer relationship, also that educational work among employees may be at a cost so small as to be almost unbelievable.

The companies that cooperated with Pacific Railway Club in this Institute were Southern Pacific Company, Atchison, Topeka and Santa Fe, Western Pacific, Market Street Railway Company, and Key System-East Bay Street Railways, Ltd.



Boston & Maine 4-8-2 Type Locomotive, Class R-1-a, Built by Baldwin Locomotive Works

Boston & Maine 4-8-2 Locomotives for Fast Freight

Latest motive power added consists of five Mountain type locomotives built by Baldwin

THE Boston & Maine, in order to provide for the movement of important freight at increased speeds, several months ago placed an order with the Baldwin Locomotive Works for the construction of five locomotives which have now been in service for some time. After careful consideration of the traffic demands the 4-8-2 type was selected. These new locomotives, known as Class R-1-a, are numbered from 4100 to 4104, inclusive. They have 73-in. drivers and are provided with boilers of large capacity. Their rated tractive force is 67,000 lb. When occasion demands, these locomotives will also be used for handling heavy passenger trains.

They are the first ones of this wheel arrangement to be used on this road. All previous heavy freight locomotives purchased since 1920 have been either the 2-10-2 type with 61-in. drivers or the 2-8-4 type with 63-in. drivers.

The new locomotives weigh 416,100 lb. in working order, of which 269,400 lb. is on the drivers, 78,900 lb. on the front truck and 67,800 lb. on the trailing truck. The light weight of the engine alone, without coal or water, is 376,100 lb. The steam pressure carried is 240 lb. The cylinders are 28 in. by 31 in., spaced on 92-in. centers. This gives a rated tractive force of 67,000 lb. Smoke lifters or deflectors are provided on each side of the smokebox. The height of the stack is 15 ft. 4⅞ in., and the width overall, 127 in. The maximum axle load is 68,900 lb.

The outside diameter of the first ring of the radial-stayed boiler is 84 in., and the large diameter next to the throat sheet is 96 in. The center of the boiler is 126 in. above the top of the rail. The firebox is 126⅛ in. long by 90 in. wide, which gives a grate area of 79 sq. ft., and is fitted with three Nicholson Thermic syphons. An additional syphon is also placed in the combustion chamber which is 66 in. long. Fuel is bituminous coal, fired by a Standard HT stoker, and grates are of the Firebar type. There are 53 2¼-in. tubes and 201 3½-in. flues, the length over tube sheets being 19 ft. The evaporating heating surface of the firebox, including 122 sq. ft. in the syphons, is 474 sq. ft., and for the tubes and flues 4,070 sq. ft., which gives a total evaporating heating surface of 4,544 sq. ft. The Elesco Type E superheater contains 1,924 sq. ft. of heating surface.

Coffin feedwater heaters are fitted to these locomotives. The cylinder saddle is carried well up on the smoke arch and is provided with pockets which permit the steam pipes to be located entirely inside the smokebox chamber. The smoke stack is 20½ in. diameter at the choke while the exhaust nozzle is of the annular ported type developed on this road. This nozzle has six ports having a total area of 48.54 sq. in.

The boiler is mounted on a cast-steel foundation bed furnished by the General Steel Castings Corporation, in which is combined the air reservoir and other parts which are made integral. The driving boxes are spaced on 40-in. centers. Axles are of the hollow-bored type. The journals on the main driving axle are 13¼ in. by 14 in., and 11½ in. by 14 in. on the other driving axles. The engine truck has 36-in. wheels, 7½-in. by 12-in. journals, inside bearings, and a wheel base of 7 ft. 4 in. Timken roller bearings have been applied to the engine-truck axles. The trailing truck has 38-in. wheels and 9-in. by 16-in. journals. The total wheel base of the engine is 44 ft. 2 in., while the length over coupler faces of the engine and tender is 105 ft. 8⅜ in.

The valve gear is of the Walschaert type, operating 14-in. diameter piston valves, with a maximum travel of 7½ in. Steam ports are 2¼ in. wide. The crosshead is of the multiple-ledge modified Dean type which has been giving excellent service on the Boston & Maine. Cab signal equipment furnished by the Union Switch & Signal Company is provided. A Loco Valve Pilot is also installed.

A Detroit mechanical lubricator with eight pumps is applied. The discharge from each pump is divided so as to feed in four directions. This lubricator supplies

oil to the shoes and wedges, driving-box hubs, trailer-truck hubs, and valve guides. A Detroit six-feed Model A mechanical lubricator supplies lubrication to the steam chests, cylinders and crosshead guides while a Nathan hydrostatic lubricator is used for the air compressors and the stoker. Alemite grease lubrication fittings are provided at many points and Spee-D fittings for main and side rods.

The tender is of the rectangular type, having a capacity for 20,000 gallons of water and 21 tons of coal. Its weight is 377,350 lb. loaded, or 160,300 lb. light. It is mounted on a General Steel Castings water-bottom underframe. The trucks are General Steel Castings equalized six-wheel type, with Isothermos journal boxes. The trucks have 36-in. wheels, 6½-in. by 12-in. journal axles, and a 10-ft. wheel base. The distance between truck centers is 26 ft. 1 in. The total length of the tender is 46 ft. 4 in., and the combined length of engine and tender over coupler faces is 105 ft. 8⅜ in.

The principal dimensions and weights of the locomotive are given in an accompanying table.

Table of Dimensions and Weights of B. & M. Mountain Type Locomotives

Railroad	Boston & Maine
Builder	Baldwin Locomotive Works
Type of locomotive	4-8-2
Road class	R-1-a
Road numbers	4100-4104
Cylinders, diameter and stroke	28 in. by 31 in.
Valve gear, type	Walschaert
Valves, piston type, size	14 in.
Maximum travel	7½ in.
Weights in working order:	
Total engine	416,100 lb.
On drivers	269,400 lb.
On front truck	78,900 lb.
On trailing truck	67,800 lb.
Tender	377,350 lb.
Wheel bases:	
Driving	19 ft. 3 in.
Rigid	12 ft. 10 in.
Engine, total	44 ft. 2 in.
Engine and tender, total	92 ft. 8 in.
Wheels, diameter outside tires:	
Driving	73 in.
Front truck	36 in.
Trailing truck	38 in.
Boiler:	
Steam pressure	240 lb.
Diameter, first ring, outside	84 in.
Diameter, back end, outside	96 in.
Firebox, length and width	126⅛ in. by 90¼ in.
Height mud ring to crown sheet, back	71⅝ in.
Height mud ring to crown sheet, front	87¼ in.
Arch tubes	None
Syphons	4
Combustion chamber length	66 in.
Tubes, number and diameter	53—2¼ in.
Flues, number and diameter	201—3½ in.
Length over tube sheets	19 ft. 0 in.
Fuel	Soft coal
Stoker	Standard HT
Grate, type	Firebar
Grate area, sq.ft.	79
Heating surfaces, sq.ft.:	
Firebox and combustion chamber	352
Syphons	122
Firebox, total	474
Tubes and flues	4,070
Total evaporative	4,544
Superheating	1,924
Comb. evap. and superheat	6,468
Superheater, type	E
Feedwater heater	Coffin
Tender:	
Style	Rectangular
Water capacity	20,000 gal.
Fuel capacity	21 tons
Trucks	Six-wheel
Journals	6½ in. by 12 in.

Fifteen-Year Campaign Wins Motor Carrier Regulation

THE SIGNING of the motor carrier regulation bill, S1629, by President Roosevelt on August 9, after its passage by Congress, as reported in the *Railway Age* of August 10, marks the end of a 15-year campaign for regulation in which the *Railway Age*, since 1920, has consistently called attention to the dangers of competition from this unregulated form of transport, not only to the railroads but to the bus and truck industry itself. During this period, the first efforts of the *Railway Age* were directed toward arousing the railroads from an attitude of complacency regarding the possibility that motor bus and truck competition could harm a long established and recognized form of transportation. At the same time it was necessary to convince some executives who feared the loss of traffic controlled by bus and truck manufacturers, that this loss would be small in comparison with the traffic diverted eventually to buses and trucks.

The seriousness of the situation, as pointed out by the *Railway Age*, was first appreciated by local communities which became concerned over the growing use by commercial vehicles of the highways which were being maintained at public expense and the increasing size of vehicles which were damaging the roads and endangering the public. As a result of this development of interest, the National Association of Railroad and Utilities Commissioners and the American Electric Railway Association became proponents for regulation and have since taken an active part in securing legislation. In 1925, the former association drafted the first regulatory bill and arranged for its introduction in Congress by Senator Cummins. This bill provided that the state commissions have regulatory authority over the railways, be clothed with authority to enforce the provisions of the Act within the states, or in certain cases in co-operation with the commissions of other states or with the Interstate Commerce Commission. Largely as a result of the efforts of these organizations and continued agitation by the *Railway Age*, Leo J. Flynn, attorney-examiner of the Interstate Commerce Commission, in a report on an investigation into motor coach and motor truck operations on January 16, 1928, recommended the enactment of federal legislation providing for the regulation of motor vehicle common carriers of both persons and property over interstate routes.

Up to this time neither the railways nor their employees had taken concerted action and little headway had been made in influencing public opinion. Regulation by federal authority of motor coach operation in interstate commerce on the highways was generally favored, as was shown in oral arguments before the Interstate Commerce Commission on February 10, 1928, but the regulation of motor truck transportation was still vigorously opposed by the manufacturers and operators of trucks on the grounds that it would hamper the development of a new industry and that there was no demand for it among shippers and the public.

Campaign Carried to the Public

Realizing that this obstacle was a serious handicap to the enactment of regulatory legislation, the *Railway Age*, in an editorial in the issue of May 19, 1928, said, "We believe that the railroads, the public utility commissions, the street railways and the highway operators who have agreed on a program of legislation should now carry

(*Continued on page 217*)

Special Methods for Dismantling Old Equipment

Southern Pacific uses stores facilities—Special precautions avoid accidents—New uses for old bodies

IN THE period from 1930 to 1935, the Southern Pacific —Pacific system has retired and dismantled 180 locomotives and 3,000 box cars, using the forces and facilities of the stores department for much of the work. The work, which continues, is performed at Sacramento, Cal., and West Oakland and Los Angeles, and at El Paso, Texas, and Portland, Ore. While no effort was made to rush the program, it was organized with special attention to the prevention of accidents, as well as economy in the handling of material, and many unusual applications have been found for old materials that would otherwise have been sold as scrap. The methods employed at the Sacramento stores illustrate how the retirement programs are carried out on that road.

The first operation in dismantling locomotives, tenders or cars, is to determine in advance those parts or appliances which can be used on other equipment, or the possibilities of securing a higher salvage value by sale. This is determined by stock-book records of requirements and by personal inspection by a competent mechanic of the mechanical department. In this determination, the mechanical condition and the cost of repairs are considered.

Loading Car Frames Cut to Charging-Box Size

Under the "Skull Cracker" at Sacramento

All dismantling work, except the removal of usable tires and the stripping of tender wheels, is performed by store department forces. Locomotives and tenders are dismantled under an overhead traveling crane, operating over two tracks 36 ft. apart. The equipment is placed on one track under the crane and the empty cars on the other track. When the serviceable parts have been removed, oxyacetylene torches are used and the locomotive stripped of running boards, jackets, outsiding piping, and the cab. After cutting away the jacket, the boiler lagging is removed and saved.

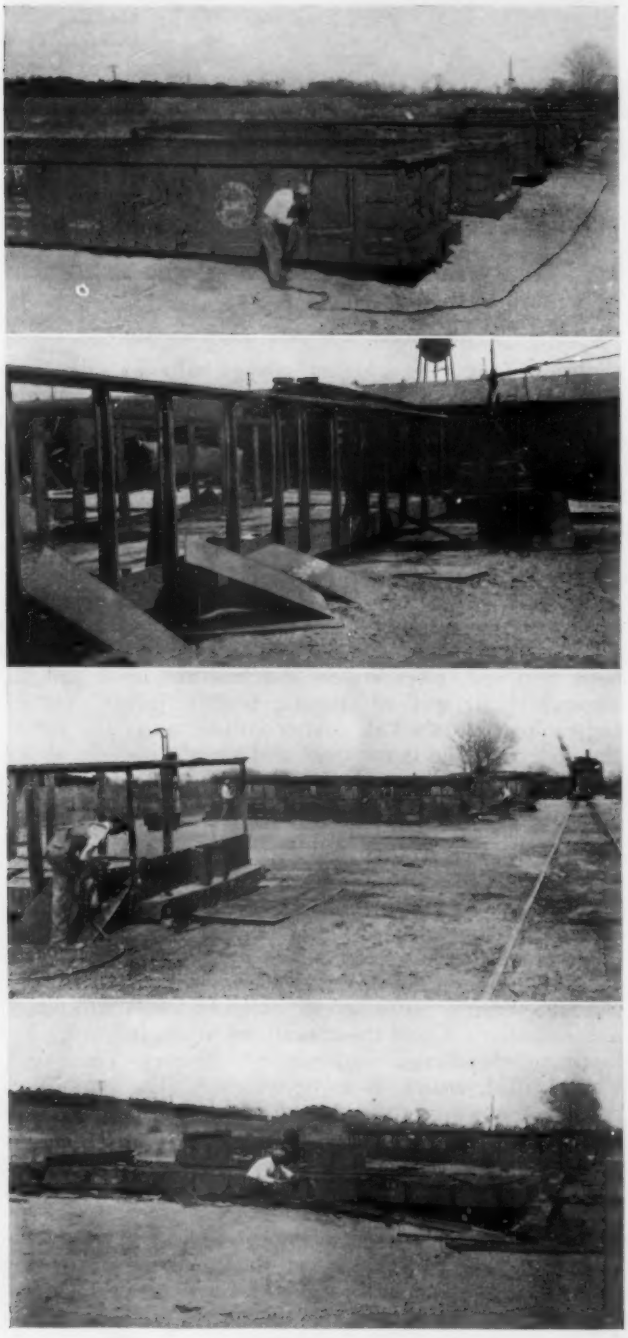
Keep Work on Ground

The boiler is then cut free from the frame, lifted by the overhead crane and placed in an upright position on bearings made of scrap steel I-beams. Between the boiler and the light-weighed cars on the opposite tracks are placed large containers made from scrap locomotive fireboxes, each holding from one to five tons of scrap. As the locomotive is cut apart and reduced to charging-box size, the scrap is immediately sorted by kinds and placed in the containers, and the containers, when full, are lifted by the overhead crane and dumped into cars. These cars, when loaded, are ready to be weighed. The removal of the boiler and firebox from the frame and placing them on the ground reduce the handling cost and also the chance for accidents by allowing all torch operators to work on the ground.

The first step in cutting up the boiler consists of removing the steam and sand domes. Two cutters, one on each side, then proceed to cut the shell, the cuts being laid out beforehand to salvage any steel required, as well as to reduce the remainder to charging-box size with the least amount of lineal cutting.

The boiler tubes are then cut from the flue sheets. A

Cutting Up Freight-Car Underframes at Sacramento



Four Stages of Cutting Condola Bodies and Salvaging Sides

cable sling is first placed on the ground so that the tubes will drop onto it as cut. The entire set of tubes can thus be lifted together after they have been cut from the flue sheets. Two pieces of pipe are also driven in the ground on each side of the tubes before the cutting begins to prevent them from striking the operators as they fall. Two operators work in unison on the same tube. After all tubes are detached, the smoke-box and fire-box are cut to charging-box size, during which usable stay-bolts are removed to be rattled, annealed, cut to required lengths and threaded. The boiler tubes are later inspected and safe ends are applied to those in good condition and the tubes placed in stock.

The next operation is performed on the trucks and frame. The side rods and link motion are first removed, after which the tension of the driving springs is relieved by cutting the spring saddles and equalizers. The frame is then cut so that the drivers can be lifted by the overhead crane. These are placed on a car and sent to the machine shop where the tires are removed. If good, the axles are pressed from the centers. If the tires are worn out, they are cut from the centers at the dismantling yard. In either case, the mounted drivers are sent to the wheel press for removal, this having proved to be more economical than cutting the axle with a torch, and it produces a full-length axle which has a ready sale. The remainder of the frame is reduced to charging-box size and loaded into cars to fill orders for scrap sold.

The cylinders are then lifted from the engine truck, the steel plate on the saddle removed and the two halves of the cylinder separated by cutting the connecting bolts. They are then moved under the overhead craneway and reduced to charging-box size by repeated blows from a breaker raised and dropped by the crane. The space in which this work is performed is surrounded by sheets of scrap iron to keep the broken pieces of metal from flying.

The engine-truck frame is then cut to charging-box size. It is during this operation that the engine-truck wheels are removed and sent to the wheel shop where they are inspected, the treads turned, if suitable for further use, or the axles and wheels separated.

Locomotive tenders are dismantled by first removing all serviceable valves or other parts and by cutting the tank in such a manner as to obtain the largest possible amount of usable sheet steel.

Three Men Per Locomotive

The forces employed in dismantling locomotives and tenders consist of two cutters and one laborer. Only experienced men are used in this work. The laborer handles all scrap as the locomotive is cut apart, sorts it and throws it into the proper containers for loading in

the cars. He also keeps the ground clear. Keeping the ground clear where the cutters are working speeds up the work and reduces the hazard. This crew of three men, with part-time assistance of the crane operator, completely dismantles and clears away all serviceable material and scrap of one locomotive and tender in five working days' time. The operation not only reduces the handling cost on dismantling operations but eliminates all further handling costs in disposing of the scrap, providing sale orders giving disposition of the scrap are made available. The total weight of the 138 locomotives and 149 tenders dismantled from 1930 to 1935 was 11,194 tons, while the weight of the 2,616 box-car frames and 219 gondola bodies dismantled in the same period amounted to 26,059 net tons.

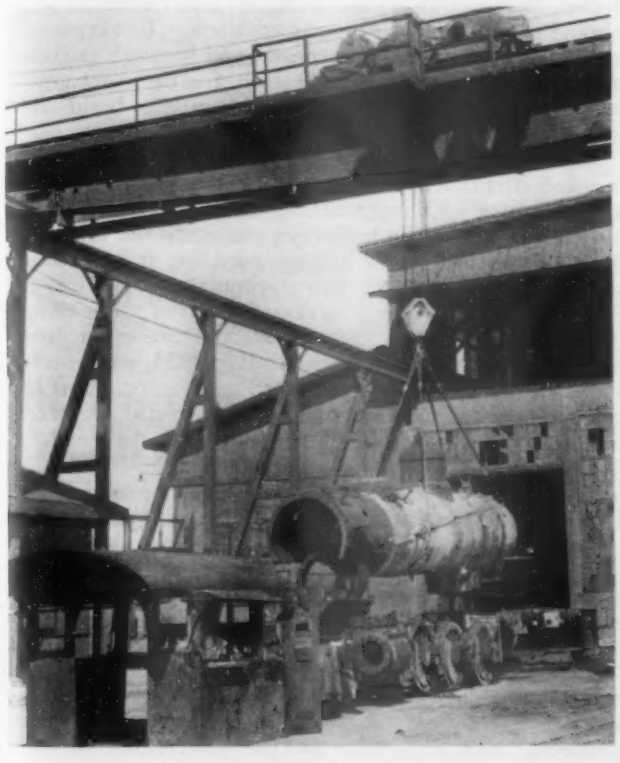
Save Car Sides

Since many of the retired cars could not safely be moved to the dismantling point on their own wheels, the number of cars required to remove this equipment is reduced by removing the wooden car bodies at division points and shipping only the trucks and underframes. The underframes are then unloaded by a locomotive crane and laid side by side on the ground. The frames are cut into charging-box size and, as the cutting is completed, the metal is picked up where it lies, by a locomotive crane and is loaded directly into cars for shipment on sale orders, the crane switching the cars as well as loading them.

In the case of steel gondola cars, all serviceable sheet steel in the car sides is first removed from the bodies and loaded into cars for delivery to the shop, to be used for car parts, running boards, gang planks on platforms, etc., after which the remainder of the bodies and frames is reduced to scrap of charging-box size and loaded for shipment.

Use Car Material on Bridges

In all dismantling work, the usable material is separated from the scrap as the work progresses and is returned to stock unless it requires repairs, when it is sent to the reclamation shop. The work on one lot of cars is completed and the ground completely cleared of all material before another lot is unloaded.



How the Locomotives Are Dismantled

Locomotive Scrap is Placed in Trays for Handling by Overhead Crane

The quantity of usable parts, such as couplers, castings and sills, and plates, obtained from the gondola cars, is especially large, but uses have also been found for considerable material from the old box cars. Twenty-foot sections of center sills of the 24-in. I-beam type were removed intact and used by the maintenance of way department for bridges and culverts; 49 pieces were shipped to an affiliated line and additional sections are now being removed to construct an underpass. Thirteen-foot sections were also removed from the center and side sills of 100 box and flat-car frames and used for reinforcing the doorways of automobile cars equipped with auto-loading devices, and sections of sills are now being salvaged for increasing the length of logging cars.

The composite figures on the cost of dismantling are as follows:

Cost to dismantle locomotives	$2.00 per net ton
Cost to dismantle tenders	1.65 per net ton
Cost to dismantle gondolas	2.00 per net ton
Cost to dismantle flat and box cars	1.40 per net ton

The figures include the cost of salvaging serviceable materials and reducing the scrap to charging-box size.

Fifteen-Year Campaign Wins Motor Carrier Regulation

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their campaign directly to the public." Its subsequent efforts, therefore, were directed toward the enlistment of the support of the public and railway employees.

Employees of the St. Louis-San Francisco were among the first to appreciate this contention, and in October, 1928, secured the signatures of 30,000 business men and employees on a petition which was sent to the senators and representatives from the nine states served by the Frisco, asking them to support the enactment of federal legislation providing for just and fair regulation of buses and trucks.

Continued persistence in efforts to arouse employee action by the *Railway Age* is shown in its issue of May 17, 1930, when it said: "Public opinion and governments swayed by it are not omniscient. As a matter of fact, these governments are characteristically lazy intellectually and are apt to give heed only to the most insistent calls upon their attention. Obviously, the first step in securing this attention should be the development of a militant and informed opinion among railway employees

themselves. If employees, who have the most at stake in the future development of railway business, and the most to lose from further development and subsidized competition with the railways, cannot be aroused to learn and disseminate the facts and insist upon justice for themselves, then there is small chance that general public opinion will take up the battle for them."

It again demonstrated its insistence in its issue of June 21, 1930, when it said, "The competition of other means of transportation has been effective mainly because they have been subsidized by the government. Under intelligent and courageous leadership the employees of the railways could have exerted a powerful influence against this subsidization of other means of transportation. Under such leadership they could exert a powerful influence against it in future.—Apparently, however, the present labor leaders are so obsessed with the idea that their sole function is to force increased costs on the railways that they cannot study the real causes of the decline in railroad employment and help adopt measures to stop it by removing its causes."

Employees Must Act

The strongest appeal of the *Railway Age* for employee action was made by the editor in an address before the Brotherhood of Railway and Steamship Clerks, Freight Handlers, Express and Station Employees at St. Louis, Mo., on October 27, 1930, when he vigorously attacked government highway and waterway policies and urged railway employees throughout the country to rise up against the policies of both the national and state governments, which he charged were largely responsible for so many of them being thrown out of work. "The difference between the way in which the railways and other means of transportation have been and are being treated," he said, "has been largely due to political influence. The railways themselves have almost no political influence, but railway employees have an enormous amount of political influence which they could use to protect their employment. If railway employees throughout the country would rise up against these government policies, which have such a plain tendency to deprive them of their employment, there would soon be a very large reduction in the number of public men who believe it is good politics to favor every measure which is harmful to the railways, regardless of its effect on the employees of the railways."

Following this address, the clerks' organization adopted a resolution protesting against the serious injury to the railway transportation system threatened by unregulated and unreliable transportation agencies. Determination of the true cost to the public of the highways used by motor trucks and motor coaches, regulation of motor transport services, extension of principles underlying railway labor laws to cover operators of motor vehicles and regulation of freight forwarding companies were urged.

Other Brotherhoods Act to Protect Employees

The effect of this advice was manifested on a still larger scale on November 19 of that year, when the 850 general chairmen of the Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen and Enginemen, the Brotherhood of Railroad Trainmen, the Order of Railway Conductors and the Switchmens Union of North America, at a meeting at Chicago, adopted resolutions decrying the unregulated competition with the railroads of inland waterways, pipe lines and motor coach and truck lines and sent copies to congressmen.

While the *Railway Age* was endeavoring to enlist employees in the campaign to secure regulation, it was also directing its attention to the formation of a definite policy within the industry. In its issue of October 25, 1930, it said, "The greatest immediate need of the railroads is for a convention of their chairmen and presidents which will last not merely for one day but long enough for the consideration of the menacing conditions and problems with which the industry is confronted and for decisions upon definite policies for dealing with those conditions and problems. . . . Never did the railroads need a definite policy for the entire industry as they do now. Never was there a time when they seemed more likely to get for such a policy the support of their employees and the public. Such a policy can be adopted, however, only by their chief executives acting in unison. There is great need for a nation-wide educational campaign regarding the situation and problems of the railways; but their spokesmen cannot have any policy to advocate for the industry until the industry has adopted one that the entire industry will stand behind."

Shortly after the publication of this editorial, the Association of Railway Executives at a meeting in New York on November 20, 1930, promulgated a program setting forth a series of proposals which were designed to cope with the unfavorable state of railway earnings and traffic.

While the *Railway Age* strove to arouse these various groups to action, it was not unmindful of the power controlled by other employees, business interests and taxpayers and, therefore, continuously endeavored to bring about their organization. Through its pages it encouraged the formation of ship-by-rail clubs and the efforts of employees to induce businesses dependent upon railway employees purchases to ship-by-rail to protect themselves.

Likewise, as in an editorial in its issue of August 15, 1931, it advocated action by taxpayers. "Is there any reason in sound public policy why dollars invested in farms, in factories, in homes should be compelled to pay their full share of general government expenses while dollars invested in motor vehicles are exempted. . . . Should other kinds of property continue to be excessively taxed for both general government and highway purposes in order, in effect, to provide doles for those who wish to use the highways at less than cost, and to build highways and manufacture motor vehicles for such use!"

Again in an editorial in its issue of Sept. 12, 1931, it called attention to the relations between highway usage and taxation. "The greater the volume of long distance trucking on the highways, the more the taxpayers must be assessed. The money paid for transportation service to long-haul truckmen stimulates a service, the growth of which requires increased taxation. The money paid to railroads for such service, on the other hand, tends to decrease taxation." By 1933, ship-by-rail clubs and the Employees and Taxpayers associations had become national in scope and were powerful factors in bringing about a better understanding of the need for highway regulation.

That this long continued work by the *Railway Age* and the many addresses made by its editor, especially before the Motor Transport division of the Association of American Railroads at St. Louis on February 27, 1929, before the Chamber of Commerce of the United States at Washington, D. C., on April 28, 1930, and before the Traffic Club of Minneapolis on December 1, 1930, have not been without result is evidenced by the public awakening to the dangers of unregulated competition, as reflected by the attitude taken by President Roosevelt and Congress in the enactment of this legislation.

How Reorganize Insolvent Roads?*

Receiverships and procedure under section 77 compared— Further legislation needed

By J. W. Barriger, III

Chief Examiner, Railroad Division, R. F. C.

WHEN a railroad corporation is unable to meet its fixed charges, its financial structure is usually adjusted to meet this condition either involuntarily through foreclosure and reorganization or voluntarily through recapitalization or readjustment. Note these distinctive terms i.e., "voluntary" implies without resort to forced foreclosure; "involuntary" denotes the latter process is utilized. A company which has to undergo either almost invariably requires money to replenish a depleted treasury and pay off some creditors in cash, and reorganization or recapitalization must provide, through the exercise of pressure on its security holders, the funds that a financially successful enterprise supplies out of earnings or its ability to invite new capital to enter the business.

Reorganization usually involves, at least in some measure, the forcible separation of creditors and security holders from what, on the face of their securities, seemed to be their contractual rights, and, owing to the legal and corporate intricacies of such processes, this becomes perhaps the most complex and difficult of all financial work and the one phase of the subject about which it is most difficult to generalize. While the ultimate driving force is the assertion by the mortgagees of a right to enforce their liens and take either the property or the proceeds of a public sale, up to the limit of the amount of their claims, in actual practice, the complex structure of interlacing and stratified mortgages on American railroads forces important modifications upon the method of exercising this right.

Causes of Financial Difficulties

Reorganization results from financial failure which in turn is usually the result of:

1. Decreased volume of business and/or maladjusted rate levels resulting from:
   (a) Excess competition.
   (b) Declining level of economic activity.
   (c) Cessation of public demand.
2. Unprofitable expansion.
3. Excessive capitalization, often the legacy of faulty reorganization in the past.
4. Mismanagement, financial or otherwise.

The Constitution of the United States reserves to the federal government the right to establish uniform bankruptcy laws and Congress has, accordingly, enacted a voluminous bankruptcy law or code. However, true bankruptcy involves liquidation of the assets and distribution of the proceeds among the creditors. Until recently it was assumed that bankruptcy was not adapted to railroads, and therefore, bankruptcies in this field prior to March 3, 1933, were excluded by statute from such procedure and were "reorganized" through proceedings in equity; better known as "receiverships." A brief explanation of the mechanism of this work may be in order.

Appointment of Receivers

The necessity or inevitability of a receivership having been recognized by the company, usually some friendly creditor with an overdue claim in excess of $3,000 and resident of another state, in order to bring action in a federal court, submits a bill of complaint to the U. S. district judge of proper jurisdiction and prays for appointment of receiver. The defendant corporation grants the allegations and joins in the petition which is granted and a receiver or receivers are appointed. The territorial scope of this receivership being limited to the area of the judge having jurisdiction, ancillary receiverships are established throughout the other judicial districts through which the railroad operates.

At least one receiver is usually a former official of the corporation and competent to direct its operations; the other one (or sometimes two) receivers are appointed by the court because of its confidence in their ability and independence. These independent appointments are made, among other reasons, to silence criticism that might arise from leaving the property wholly in the hands of those under whose control it failed. Often these independent receivers are lawyers. Once in receivership, the court is in full control of operations, but its powers are administered through the receivers. Receivership prevents unsecured creditors from obtaining judgments and attaching the property of the debtor in satisfaction of claims and stays, until further order of the court, and the immediate foreclosure of defaulted liens with the resultant possible dismemberment of the property.

One of the privileges and opportunities of a receivership is the right to disaffirm, with the approval of the court, any contracts that are proving burdensome, and this important duty requires prompt attention of the receivers for it will lapse if not exercised within a limited period. The receivers may also issue "receivers' certificates," upon approval of the court for appropriate receivership purpose and such obligations may have such priority of lien as the court determines is necessary to insure ready sale for cash. However, in all such matters, the receivers and the Court are obliged to give due notice of said contemplated actions and hold hearings in order that deserving protests may be given full consideration.

Protective Committees

Protective committees are appointed to represent the interests of each of the groups of security holders which have been adversely affected by the receivership. Usually not all of the security issues pass into default. As a rule equipment trusts and some of the underlying or divisional liens continue through without default and a protective committee is only rarely necessary to repre-

* An address delivered before the Transportation Club of Washington, D. C.

sent these more favored securities. The protective committees may be appointed either before or after receivership. The several such groups may be self-appointed or they may be created through the direct action of the bankers who have been identified with the road's financing or the institutions, principally life insurance companies or savings banks, which are the largest holders of its bonds. The committees usually, though not invariably, request the deposit of securities with a trust company against which are issued certificates of deposit (which are usually listed in the Stock Exchange). This is done to give the committees affirmative authority of representation. The powers of the committees and the right of depositors are fully defined in a protective agreement filed with the depositaries. As a rule these are very broad and inclusive documents from the committee's standpoints.

It is customary for the actual reorganization plan to be drawn up by a smaller committee, which is either a sub-committee comprised of the principal individuals on the several protective committees or is a banking firm. The drafters of the plan are termed the reorganization managers or reorganization committee. Eventually a reorganization plan is evolved. Probably during, or prior to its drafting, careful engineering and accounting investigations must be made, to make information available on the past income, assets, property condition, earning power and traffic outlook of the property in order that these important factors may be carefully evaluated in the preparation of the new plan. A plan of reorganization invariably must provide for (1) reduction of fixed charges, (2) provision of necessary cash, (3) creation of a new financing medium which will place the company in possession of securities of sufficient asset value and earning power that their sale will be possible from time to time in the future as additional capital may be required, and (4) funding of floating debt.

Reducing Fixed Charges

The reduction of fixed charges is accomplished by conversion of fixed interest bearing debt into contingent interest-bearing debt or stock. The provision of new money is obtained through an assessment usually levied wholly against the capital stock in return for which an equal face amount of new bonds may be given. A future vehicle of financing is created both by providing a new mortgage of adequate, though not necessarily first, priority to insure asset and income coverage adequate to make the bonds which can be drawn down under it, salable under all normal conditions. At the same time the capital structure is generally recast with at least the hope of placing the total capitalization in sufficiently reasonable line with prospective earning power to insure that new capital stock may be sold at par within a few years and thereby to permit financing through share capital rather than through exclusive resort to bonds which inevitably leads to trouble.

To recast capital structures so as to achieve these necessary ends, if the readjustment can properly be a lenient one, there is no compression or at least no major reduction in the par amount of the total capital structure, merely different classes of securities give up some part or all of their fixed claims on income for a contingent one and possibly step back one stratum in lien. Indeed, a capital structure may actually emerge from reorganization in greater par amount than the one of the former bankrupt company, if, as is often the case, miscellaneous deficits have to be paid off in cash or securities without an offsetting reduction in the former equity. On the other hand a drastic recapitalization not only reduces fixed charges, but actually reduces the amount of the capital structure by wiping out all or part of the equity and in some cases even scaling down junior bonds.

The type of reorganization plan depends upon the nature of the individual problems affecting the company, the general economic situation, the ideas of the reorganization managers and the ability with which the respective interests are advocated or defended and other circumstances. It would be an interesting study to analyze the actual details of typical reorganization, especially to compare those which in the past have proved so highly successful as the Union Pacific and Atchison with the others such as Missouri Pacific and the Frisco which proved inadequate and will have to be done over.

Voluntary Reorganization

Once a reorganization plan has been promulgated, it must be made effective. The plan inevitably separates certain of the interests concerned from what were their contractual rights. If a sufficient number of the security holders are in agreement, which means virtually 90 per cent of every class, the recapitalization can be put through on a voluntary basis and this process is what has been previously referred to as recapitalization or readjustment. Should the reorganization be a very lenient one, this probably can be effected in other cases, as for example the Texas & Pacific and Forth Worth & Denver City and the International-Great Northern, where the railroad possessed valuable charter privileges which would have been lost were existence of the company extinguished through reorganization; the threat of this forced security holders into line and brought about voluntary recapitalization without foreclosure but usually this is impossible and it is necessary to deal with objectors through foreclosure.

In order to prevent injustice being done to non-assenting security holders through this process, a minimum price, usually called an upset price, is fixed by the court. Anyone can bid for the property at the sale, but the court will not permit it to be sold for less than the upset price. At the time of the public sale the reorganization committee, or its representatives, is usually the only bidder because, while the bid must be paid in either cash or securities of the railroad, meeting the upset price in cash would usually be prohibitive and only the reorganization committee is in control of sufficient securities to pay this price in defaulted bonds, plus sufficient cash, raised through assessment to pay off non-assenters to the plan. The result is the reorganization committee usually bids a few dollars more than the upset price and gets the property.

This upset price may be an over-all amount or it may be a specified amount plus the obligation of assuming certain underlying bond issues that have not passed into default together with the miscellaneous expenses of the receivership. The bid made by the purchaser of the railroad determines the proceeds of the sale, and the distributive share which must be paid in cash to non-assenters. The latter circumstance insures a bid very close to the minimum upset price. The railroad property is then transferred to a newly created company, usually of the same name except that the term "railroad" and "railway" are interchanged. The new company thereupon proceeds to obtain the Interstate Commerce Commission's permission to issue its securities and to operate the property, and the stocks and bonds which it is to issue are in due course delivered to the purchasing committee in exchange for the property.

The new securities received are distributed to the holders assenting to the plan in accordance with its terms. Assessments are paid at the time of receiving the securities of the new company. Funds raised thereby go

principally to the treasury of the new company, but part must be utilized to pay expenses of the receivership, which are invariably heavy, and also sufficient cash must be paid to the court to enable it to settle with the non-assenting holders in accordance with the decree value determined by the bid price for which the property was sold at foreclosure.

In order to secure successful consummation of a plan, the reorganization managers must be assured that the assessments will be paid in full and so make the required cash available. Payments of assessments can not be left to chance; hence they must be underwritten by a banking syndicate which agrees, in consideration of a fee, to pay the assessment of those stockholders who do not elect to do so, and upon doing so, it will, of course, receive those securities which would otherwise have been allocated to the stockholder.

Evils of Equity Receiverships

The equity receivership procedure just outlined is subject to several serious evils in practice, viz:

(1) Reasonable relief for equity from excessively harsh circumstances of foreclosure proceedings.

(2) Expense of numerous ancillary receiverships.

(3) Expense and delay of judicial sale of railroad properties.

(4) Litigation to determine the rights of non-assenting security holders which also causes heavy expense and much delay.

(5) Inability of the Interstate Commerce Commission to exercise any direct control over the reorganization plan except the remote and belated one through its veto power to approve the necessary issuance of securities by the reorganized company and the latter's acquisition and operation of property.

(6) Inability of Interstate Commerce Commission to control fees and expenses.

I have not the time here to elaborate all those difficulties, but I want briefly to consider one of them. The judicial sale of the railroad at not less than the upset price fixed by the court is supposed to be for the protection of those security holders who are not willing to take new securities under the plan. The theory is that the cash bid at the sale will mean that those dissenters will be sure to receive cash approximating the reasonable value of their interests.

But the truth is that the judicial sale of a great railroad and the upset price are, in fact as distinguished from theory, almost wholly farcical. No one except the reorganization committee can possibly make a bid at the sale. And, almost invariably, the court, in fixing the upset price, uses a figure which is suggested by the reorganizers, and the reorganizers, in turn, fix that price so low that the distributive share of the cash bid at the sale, which will go to the non-assenters, is less than the cash value of the securities which would be issued under the plan to those security holders if they withdrew their dissent. This means that the dissenter has a choice of either taking new securities under the plan or cash which is less in amount than the value of those new securities. Obviously then, the sale and the upset price in no manner protect the dissenter, but instead usually put him in a worse position than he would be if he accepted the plan. The whole business of court sale and upset price is then a very elaborate piece of machinery for driving the dissenters into an acceptance of the plan.

Consequently, since the sale and upset price do not help the dissenter, his only recourse is to attack the plan by appeal or collateral suit. There is much legal learning on the dissenter's rights thus to attack the reorganization plan. I cannot go into that, but I can say that the equity-receivership-judicial-sale-upset price-method of dealing with railroad reorganizations may easily lead to prolonged litigation which often unduly delays the winding up of railroad receiverships. It is an antiquated and cumbersome procedure which neither (1) protects the honest conscientious dissenter from an unfair plan, nor (2) insures prompt and final court approval of a fair plan in such a way as to cut off the objections of "strikers" who seek selfish advantages by the threat of prolonged litigation and consequent delay.

Section 77

The foregoing objections to equity receiverships together with the increased difficulty of reorganization through them during the serious depression years because of the dual difficulty of raising new capital through assessments and in effecting voluntary readjustments when earning power had declined so seriously, led to the enactment of Section 77 of Chapter VIII of the Bankruptcy Laws on the final day of the last administration in order to establish what was hoped would prove to be a reformed and more workable mechanism for railroad reorganization. Section 77 eliminated the necessity for ancillary receiverships and provided, that with certain exceptions, a plan confirmed by the court would bind all security holders of each class of which two-thirds shall have approved it. Moreover, Section 77 abolished the necessity for a sale of a great railroad property at a judicial sale where there could be but a single bidder—the reorganization committee.

Under Section 77 a railroad company, if it elects to seek the protection of the Act, may voluntarily file a petition in the federal court having jurisdiction over the area in which the railroad company's principal office is located, stating that it is either insolvent or unable to meet its debts and it desires to reorganize its capital structure. Creditors representing at least 5 per cent of the company's debt may also invoke such proceedings. The United States district judge must, unless fraud or bad faith is evidenced, grant the petition and take jurisdiction of the property as a debtor and stay the enforcement of liens and judgments. The court may also, if it desires, appoint a temporary trustee from a panel designated by the Interstate Commerce Commission and may subsequently make that appointment permanent after hearing. The trustee has powers and duties identical with a receiver, except the court vests full title to the property in the trustee and expressly directs him to conduct its business. The trustee's compensation is set by the Interstate Commerce Commission; he is required to file a public record of stockholders and creditors of the debtor; and he may issue trustee's certificates. In practice, trustees have only been appointed upon petition of creditors where cause for such action has been shown.

The debtor, the trustee, or any group constituting not less than 10 per cent in amount of any class of creditors or stockholders may present a plan of reorganization which is required to be submitted to the Interstate Commerce Commission for hearing and approval. After hearing, the Commission must make a report incorporating its recommended plan, both of which, i.e., the report and the plan, shall be submitted to the creditors and stockholders of the railroad company for their acceptance or rejection. When two-thirds of each class of security holders accept, this fact is certified by the Commission. Thereupon it is submitted to the court for formal hearing and approval. If the court sanctions

the plan it is confirmed and consummated, and the railroad company is discharged from all its debts except those which are expressly assumed in the plan, and is relieved from the jurisdiction of the court to resume independent operation under the administration of its directors and officers.

Veto Power of Security Holders

The Interstate Commerce Commission is restricted from certifying approval of any plan until two-thirds of every class of creditors and stockholders whose interests are affected thereby shall have approved the plan except that stockholders' assent is not necessary if the debtor is insolvent or the debtor's company has accepted the plan through appropriate corporate action or should the Commission hold that the plan does not adversely affect the stockholders.

The requirement of two-thirds approval of each class of creditors makes this classification extremely important because any one group can exercise the veto power. The law specifies that classification shall be according to the nature of the respective claims. Controversy has already developed over this matter as individual interests endeavor to improve their position by being designated a separate class or being placed in a class which it can control. Unless the debtor admits insolvency, lengthy litigation can be anticipated should this point arise which involves proof that the fair value of the property is less than the debts against it. Another O'Fallon case may perhaps result from this.

Where more than one-third of any group of stock or bond holders refuse to assent and their assent is not abrogated by the above considerations, protection is given through the requirement of sale either subject to or free of liens at a fair upset price to be set by the Interstate Commerce Commission or the value of the old or new securities may be appraised together with payment to the dissenters of the value of their old claims determined in this way should they not elect to accept securities proffered under the plan. It remains to be seen whether these provisions will effectively eliminate the old difficulties relating to the price which Section 77 was expected to obviate.

Section 77 has various paragraphs, viz., (o), (p) and (q) which incidentally were carried over bodily by specific reference into the Emergency Transportation Act of June, 1933, establishing the office of Federal Coordinator of Transportation, designed to protect labor. Section (o) provides that no judge or trustee administering a railroad under Section 77 shall change wages or working conditions of railway employees except in the manner prescribed in the Railway Labor Act. This is to prevent bankrupt railroads utilizing the privilege of abrogating contracts to breach those made with labor.

Section (p) specifies that railroads administered under the Act shall not deny or question the right of employees to join labor organizations of their choice and the railroad or its administrators may not use the funds thereof to maintain so-called company unions. Section (q) prohibits any railroad under the Act from requiring any employee to sign any contract promising not to join a labor organization, such contracts being familiarly known in labor parlance as "yellow dog contracts," and where such contracts exist they are abrogated.

Changes in Section 77 Proposed

Section 77 was hastily contrived in an effort to codify and at the same time change the pre-existing law relating to reorganizations, and it was expected to speed reorganizations. However, it created many new legal problems which the courts have not yet settled so that unless it is further modified in certain particulars it may operate rather to slow up than to accelerate reorganizations. Six major roads have resorted to its protection, viz., Missouri Pacific, Frisco, C. & E. I., C. R. I. & P., Monon and C. G. W., but virtually no important progress has been made toward the reorganization of any of these. A number of legal authorities believe that the Act in its present form does not lend itself to easy accomplishment of its purpose and suggest that important amendment or complete rewriting may be necessary. The Co-ordinator has evidenced this by recommendations in his recent report which have been embodied in a bill—H. R. 6249, introduced by Representative Sumners of Texas.

However, Section 77 does not prohibit the remedies available in equity and it expressly provides in subdivision (k) for equity receivership in either federal or state courts, should there be a failure to effect reorganization under Section 77. At least two judges administering railroad bankruptcies have indicated a determination to dismiss the bankruptcy proceedings and to proceed to equity receivership, if composition of the debtor's problem are not consummated with reasonable promptness. This is possible, for the court may of its own order dismiss an ineffectual bankruptcy proceeding.

It would seem that this presents undesirable alternatives of a somewhat inadequate bankruptcy procedure or an undesirable equity receivership procedure. The situation seems to call for some legislation which will remove the undesirable features of either one or the other type of reorganization machinery. A sound corporate and financial structure is the most priceless heritage that can be given a railroad and in order to insure that our transportation systems of the future have strong constitutions, we must have legal machinery adequate for that purpose.

The Paradox of Nationalization*

By Kenneth F. Burgess

IN point of fact, government ownership of railroads is the great paradox of the present railroad situation. No important group of our citizens advocates it, at least openly. No important group which is associated with the railroad industry or which depends upon it seems desirous of sponsoring any such program as this. Neither the investors and holders of railroad securities who, under our present system, are the owners of the railroads, nor the officers and employees of the railroads who are operating them, nor the shippers and travelers of the country who are dependent upon the railroads in large part for their transportation, are proposing government ownership as an affirmative remedy. In fact, the spokesmen for these several groups, so far as they have expressed themselves, are hostile to any such program.

In spite of this, so eminent an authority and so intelligent a student as Professor Winthrop M. Daniels of Yale University who, for many years, was a member of the Interstate Commerce Commission, and whose

* From an address made by Mr. Burgess, a member of Cutting, Moore & Sidley, Chicago, and formerly general solicitor of the Chicago, Burlington & Quincy, before the Junior Traffic Club of Chicago.

† Since the date of Mr. Burgess' address, the railway labor executives association has adopted a resolution favoring government ownership and operation of the railway.—EDITOR.

judgments of the problem have always been reasonably conservative, presented an article in the January issue of Current History entitled, "Toward Nationalized Railroads," the word "nationalized," as I understand it, being a sugar-coated substitute for "governmentally owned." Professor Daniels, after analyzing the present situation, concludes with the statement that there is a likelihood of government ownership and operation of the railroads in the not distant future because (1) of the large railroad indebtedness to the federal government; (2) of threatened widespread insolvencies and of the depressed market price of railroad stocks, which would make available a controlling interest at a low figure; and (3) of the eagerness of some large holders of railroad bonds to surrender them in exchange for government obligations.

No Imminent Danger in Causes Cited

For my own part, I am not convinced that there is any imminent danger of government ownership—or nationalization, if you prefer that term—at least not in the causes recited by Professor Daniels. The conditions which he mentions undoubtedly exist, but they have existed in whole or in part at least twice before, once in the seventies and again only a few years ago. At the conclusion of the war period and when the railroads were returned in 1920 to their owners upon the termination of federal control, the debts of the railroad corporations to the government were approximately the same as the present indebtedness of the railroads to the Reconstruction Finance Corporation, and, in addition to that, the railroad plant was then wholly inadequate for the traffic of the country. The depressed market price of railroad stocks, while not so great then as now, was certainly on a very subnormal plane—much lower than in railroad history up to that time. There were also insistent groups of railroad bondholders who thought they saw an opportunity to substitute government obligations for their railroad securities. All these conditions existed at that time, and yet, as a result of forward-looking legislation by Congress, coupled with an increase in traffic, the railroads were able, within an unbelievably short period of time, to overcome their physical and financial disabilities, and thereafter to become reasonably profitable, and certainly to be looked upon as safe investments.

In pointing these facts out, I do not mean to cast aside the specter of government ownership, because there is a real hazard that it may eventuate. But if it does come it will, in my opinion, come not from any of these causes that have been mentioned up to date, but rather because the public sits idly by and permits the railroad industry to be diverted from its essential function, that is, the furnishing of transportation, into a machine or vehicle for trying out upon the body politic schemes for socializing industry in all its phases.

As railroad labor has suffered from the depression, it has become more cohesive and more of an economic force, not only within the railroad industry, but in connection with the shaping of legislation. The possibility of economies through co-ordination and joint use of terminals under the Emergency Transportation Act of 1933 was completely nullified by the Labor Amendment to that act, which prevented reductions in the numbers or compensation of employees. The company union has been outlawed for all practical purposes in the railroad industry, by amendments to the National Bankruptcy Act and the Railway Labor Act.

A railroad pension bill was passed by Congress a year ago upon the solicitation of representatives of railroad labor. This act (since declared unconstitutional) singled the railroads out of all industry in the United States upon which to impose, at the expense of the railroads, a compulsory pension system for employees 65 years of age. It may be that, consistent with the economic thinking of our times, such a pension plan is desirable in the public welfare and should be imposed upon all industry. That problem remains presently undetermined. But the significant fact is that the first time the government seeks to exercise such a power, it directs its legislation not to industry as a whole, but to the railroads, which least of all are in a position to submit themselves for social experimentation.

Legislative Program a Factor

Let me direct your attention briefly to the legislative program which is now pending in Congress. There is the six-hour bill, which would make six hours the standard day on railroads for purposes of pay and overtime. Even on the present reduced volume of business, this bill, if enacted into law, would result in an added cost to the railroads of more than $400,000,000 a year. Then there is the train length bill, which would limit trains to 2,640 ft. in length, or not more than 70 cars. In actual operation this would mean limiting trains to 60 cars; the immediate and direct effect of which would be to add some $200,000,000 more to railroad expense. Then there are the "full" crew bills, which propose to add more men to the crews of certain trains, regardless of whether or not they are needed, at an estimated additional cost of more than $80,000,000 a year. Then there are some very cleverly drafted bills, the net effect of which would make necessary increased railroad employment, at added cost to the railroads, which are known as the hours of service limits bill, the government track inspection bill, and the government signal inspection bill. It has been estimated that these several bills, if enacted into law, would increase railroad costs by substantially more than $1,000,000,000 a year.

The federal co-ordinator, recognizing the futility of trying to increase railroad income to meet these costs, has pleaded publicly with the representatives of railroad labor to desist in their efforts. This the latter have declined to do, even though the co-ordinator himself assured them that he was studying and intended to propose various new measures for the aid of the employees. These measures, as foreshadowed by his recent report, include unemployment insurance and a plan for dismissal compensation, which will require the railroads to continue to pay their employees when they are no longer needed and after they have been dismissed from service.

Whether or not we agree or disagree with the social and economic theory that underlies such plans as these with respect to the duty of industry to its former and present employees, the fact remains that schemes are being proposed for application to the railroads which the country is not yet ready to embrace in respect to industry generally. No thinking man can say that the railroads could withstand the impact of these added burdens. Certainly the ratepayers, those who ship and travel, cannot assume the increased cost. Inevitably the third act of that sort of a drama depict a government expropriation of the railroads, with the taxpayer taking over the obligations which the ratepayer cannot meet.

The railroad stockholder has long since ceased to participate in railroad profits, for there are no profits. The railroad bondholder, he who invested his money in the railroad enterprise on the basis of a mortgage obligation, has likewise ceased, in many instances, to receive any income, and his principal is in jeopardy as well. The

shipper is still receiving adequate transportation, because the railroad plant is sufficient to take care of the depleted traffic of the country, and because railroad management has continued to put service ahead of interest and dividends. Other groups, while not advocating government acquisition of the railroads, have adopted a course of conduct which, if put into operation can have no other outcome.

No Group Sponsors It

Let us keep in mind the paradox of railroad nationalization. No group openly advocates it, no group appears willing to sponsor it, yet it may come unwanted, unsolicited, until like the camel at night in the tent of the Arab, it takes complete possession with a sort of grim finality. If this is the outcome it will be due to the willingness of the American people to have railroad regulation diverted from the adequacy and efficiency of transportation and reasonable and non-discriminatory rates and to concern itself with social experimentation. Under such a view regulation will become strangulation. As sometimes happens with the surgical operation, which is heralded as wholly successful, the patient may pass into oblivion.

Communications . . .

The Railroad Fan

ELDON, MO.

TO THE EDITOR:

There was a time when a youngster with the necessary enthusiasm could land a job in some capacity on some railroad and work upward, but that day has passed. Seniority in every branch of railway service stretches a long way, and it will probably be many years before much new help is employed. The railroad fan can hardly hope to be part of railroading now. All he can do is to collect photographs and make model railway equipment.

If you and I could turn back the clock and envision the thrill we got out of our first call, the eagerness with which we signed our name, we might be more sympathetic and friendly toward the fan who wants a snapshot for his scrapbook or to spend a few minutes in the cab of an old-time engine awaiting the scrap heap.

We think of railroad fans as "kids," and so they are, but many of them are "kids" of 50 or 60, with tickets to buy or freight to ship, and, if we give them a better break, we shall have made railroad friends—a necessity in 1935.

The stage is all set and the actors are awaiting their cues all the way from the Gulf of Mexico to the last rail in the frozen north, and from New York to San Francisco. We have a show that can bring back business and prosperity. Let us then cater to the vast audience who, with a little encouragement, will flock to see it.

JIM BULLARD,
Conductor and Chairman Business Committee,
Chicago, Rock Island & Pacific.

Designs for High-Speed Locomotives

NEW YORK.

TO THE EDITOR:

The current activity in this line recalls the period of 1900, when the World's Fair at Paris inspired contributors to engineering journals with many ideas relative to the development of high-speed steam power, and design contests were held. There is this important difference, however: proper demand had not yet arisen thirty years ago, and there were then many carefully worked out paper proposals, but few working examples. Today the paper proposals appear more hastily made, but we have a good number of high-speed engines running in various parts of the world.

The design by C. Louis Otto in the *Railway Age* of August 10 opens up a number of interesting questions which would indeed require a much more detailed article in order to give the reader a concise basis for further consideration.

It is refreshing to see beauty and style coming more in the foreground—though the engineers of the old school have often done very well in this respect. The beautiful lines of most locomotives are spoiled merely by miscellaneous accessories. Judgment of beauty is bound to be very individual, so we cannot expect too general agreement, but I venture to raise a vote in defense of the "short-cut process" to which Mr. Otto refers: The "Commodore Vanderbilt" of the New York Central, although being a "wrapped up" standard engine, has beautiful and imposing lines, made with simple and cheap means without the expensive pressed or cast shapes in Mr. Otto's drawing which are obviously taken from automobile practice, but we do not here enjoy the benefit of a mass production thousand times exceeding the number of locomotives that can ever be built. In addition, it is aerodynamically very favorable and has an effective smoke lifter, which Mr. Otto's is probably not. I wish to point in this connection to the British "Cock o' the North" (Railway Mechanical Engineer, February, 1935), the sister engine of which received again the old German or French side plates because the former's arrangement, closely resembling Mr. Otto's, was not effective enough.

The magic of articulation must be taken with a grain of salt. The "Rebel," a Diesel train, has already abandoned it for good reasons; to introduce it between engine and tender leads to pleasant lines, but holds no promise otherwise. One should say "reintroduce" it, because for many years after the middle of last century articulated 0-6-4 and 0-6-6 "tank"-engines did service in the Semmering Mountains in Austria. There was good justification for those successful old engines, because the fixed pivot on the articulated truck gave stability to what would otherwise have been a very unsteady 0-6-0 design with overhanging cylinders and firebox. But compared with a 4-4-4 type, or even a 4-4-2, no increase in stability would be obtained and the roundhouse and operating men could never tolerate an accumulation of inaccessible parts such as would result at the junction of a present-day articulated engine and tender, with a six-wheel clasp brake truck, the ashpan, drawbar, stoker, engine and tender supports and, perhaps, booster all coming together. In the sketch shown in Mr. Otto's article, by the way, it is not clear how the first rear truck axle could get any load with the engine crossbeam resting on the hindmost axles and the tender also.

Many controversial points are lightly raised and settled in the proposed design. Locomotive specialists would be very happy if they could so easily declare that 80-inch drivers are better than any larger ones. This is an interesting subject, but by no means settled, and it cannot be settled without saying what design features should accompany such 80-inch drivers.

No doubt, co-operation with the industrial designer is highly to be recommended to the locomotive builder. Beauty of style is not to be neglected. But the steam locomotive must never give up its greatest trump card against its competitors: Low cost and simplicity. It is not untimely to remind that Diesel locomotives will soon be produced in series. Steam equipment must follow that example (since it failed to precede it), otherwise more and more ground will be lost. However, standardization must be accompanied by intense study of the many controversial points that still confront and confuse us. Surely this can be accomplished, but time is indeed getting short for the task.

A. GIESL-GIESLINGEN.

NEWS

1934 Deficit of $920,147 for Federal Barge Lines

Compares with 1933 net income of $30,049, according to report filed with I. C. C.

For some reason, the Inland Waterways Corporation has not yet published its usual annual report to the Secretary of War, which ordinarily comes out in the spring, but its report for 1934 filed with the Interstate Commerce Commission shows a net deficit for the year of $920,147, as compared with a net income for 1933 of $30,049, on an investment reported as $23,937,835 at the end of the year. This makes the debit balance to profit and loss at the end of 1934 $504,890.

The report filed with the commission is without the voluminous comments by President Thomas Q. Ashburn which usually are included in the pamphlet report, but it shows both a reduction in revenues and tonnage and an increase in operating expense.

Water line operating revenues for 1934 were reported as $4,301,088, a decrease of $716,997 as compared with 1933, but the operating expenses were $5,168,791, an increase of $240,452, leaving a net deficit from water line operations of $867,703, which was worse by $957,369 than the showing for 1933. The freight revenues were $4,105,977, a decrease of $627,053, although the tonnage carried, 1,400,406, was only about 5 per cent less than that for 1933, when 1,479,157 tons were reported. Of the increase in expenses about $204,000 was reported in the item of transportation expenses, largely in the cost of operating vessels and operating terminals.

The greater reduction in freight revenues than in tonnage indicates a reduction in rates such as was foreshadowed to some extent in the annual report issued last year. General Ashburn said a serious question had been raised "as to how far the Federal Barge Lines should go in combating destructive competition and co-operating with trucks to give the public cheaper water transportation." The report also quoted L. D. Chaffee, traffic manager of the Federal Barge Lines, as saying that "we must make reductions in rates which, to a degree at least, may be considered drastic, if the corporation is to carry out its purpose."

Railroad Employment

The number of employees in the service of the Class I railroads (excluding switching and terminal companies) at the middle of the month of July was 1,018,025, according to the Interstate Commerce Commission's preliminary report. This is a reduction of 2.94 per cent as compared with the number in July, 1934, but an increase of 0.31 per cent as compared with the number in June.

The commission has also issued its regular report for May, when the number of employees was 997,078. This was 4.5 per cent less than the number reported for May, 1934, but the total compensation, $139,227,747, was 7.07 per cent greater in May, 1935, than in May, 1934, as a result of the full restoration of the 10 per cent deduction in pay that became effective in 1932.

Liberty Limited on 17 Hr. 40 Min. Schedule

The Liberty Limited of the Pennsylvania will be placed on a schedule of 17 hr. 40 min., or 40 min. faster than its present schedule, between Chicago and New York, effective August 25. No extra fare will be charged. It will leave Chicago at 2:30 P.M. instead of 2:15 P.M. as at present and will arrive in New York at 9:10 A.M. instead of 9:35 A.M. No change will be made in the westbound schedule.

"400" Now Has Feeder Bus Service

Feeder bus service has been established at Adams, Wis., and South Beaver Dam two of the four intermediate stops made by the "400" of the Chicago & North Western, to increase the service coverage of the train. At South Beaver Dam the bus carries passengers from and to Green Lake. The bus connection at Adams serves patrons at Wisconsin Rapids, Port Edwards and Nekoosa, buses leaving Wisconsin Rapids at 5:30 P. M. to meet both north and south bound trains at Adams and leaving Adams on the return trip at 6:50 P. M. after the arrival of the two trains.

I. C. C. Fails to Find Undue Discrimination in Minnesota State Rates

The Interstate Commerce Commission has discontinued its proceeding of investigation, undertaken on petition of the railroads, as to the refusal of the Minnesota Railroad and Warehouse Commission to authorize the railroads to apply on intrastate traffic the emergency charges authorized by the federal commission for interstate traffic. The report says that the railroads at the hearing did not undertake to show the relative transportation conditions on intrastate and interstate traffic and that undue prejudice or unjust discrimination cannot be presumed from the mere fact that the intrastate rates differ from the interstate rates.

Motor Carrier Division Organized by I. C. C.

Board of three commissioners will administer motor vehicle regulatory law

For the purpose of administering the provisions of the "Motor Carrier Act, 1935" (Part II of the amended interstate commerce act), approved August 9, 1935, the Interstate Commerce Commission has ordered that an additional division of the commission be created, to consist of three commissioners, and that work and functions arising under the motor carrier act be assigned thereto. Pending certain other necessary rearrangement of functions, the division will be known as Division 7—Motor Carriers. At the outset, Commissioner Eastman will serve as chairman of that division. The other two members of the division will be announced later; meantime, it is expected that Commissioners McManamy and Lee will be designated to serve temporarily. Possibly the commission is awaiting the appointment by the President of a "motor-minded" commissioner to succeed P. J. Farrell.

Commissioner Eastman, while continuing as heretofore his duties as federal co-ordinator of transportation, will serve on the division until the organization of the commission for the administration of the motor carrier act has been developed, provided he finds that such service will not interfere with his duties as co-ordinator. For purposes of this administration a new bureau, to be known as the Bureau of Motor Carriers, will be organized with John L. Rogers, who has been executive assistant to the co-ordinator, as director. The announcement said:

"The commission is a public body bipartisan in its membership and nonpolitical in its activities. The Bureau of Motor Carriers will be organized in an endeavor to follow faithfully both the letter and the spirit of the civil service regulations."

Announcement will be made later as to what, if any, portions of the motor carrier act will be deferred in their effective date beyond October 1 next, as authorized by Section 277 of the new act.

After signing the bill on August 9, with a pen furnished by American Trucking Association, Inc., the President said he had found it very long and confusing to read and had asked Mr. Eastman to prepare a summary, which he made public, as follows:

"The motor carrier act which the President signed today provides the first regulation of such carriers undertaken by the

federal government. It applies to all common and contract carriers engaged in the interstate transportation of passengers or property, but, except in one important particular, exempts vehicles used exclusively in carrying livestock, fish, or agricultural commodities or in the distribution of newspapers. There is a specific exemption of vehicles controlled and operated by farm co-operative associations. Persons who engage only casually or occasionally in transporting passengers or property for compensation and carriers which operate only within metropolitan areas are conditionally exempted. Regulation is also provided for brokers, or those who arrange for transportation, but do not themselves provide motor transportation service.

"The act requires common carriers to secure certificates of public convenience and necessity before they may operate, but these are given as of right to such carriers as were in bona fide operation on June 1, 1935. Contract carriers are to secure permits, but those in operation on July 1, 1935, may receive such permits upon application and a showing of bona fide operation. Brokers must secure a license, requiring, among other things, adequate proof of financial responsibility.

"Common carriers are required to establish just and reasonable rates and are forbidden to discriminate in their rates or service. Their rates may be regulated as to both maxima and minima. In keeping with the different character of their operations, contract carriers are subject to only minimum rate regulation. Considerable latitude is given in the regulation of such carriers.

"Other matters made subject to regulation are the consolidation or merger of properties, the issuance of securities, and the financial responsibility of the operators. Appropriate reports may be required from motor carriers and brokers and their accounts may be prescribed.

"All carriers, including those which are otherwise exempted, are made subject to regulation with respect to the qualifications and maximum hours of service of their employees and the safety of their operations and equipment.

"The administration of the regulation provided in this act is entrusted to the Interstate Commerce Commission, but provision is made for extensive utilization of the trained personnel of the States through the use of joint boards to be created, generally, from the membership of the state commissions. The act provides assurance against interference with the exercise by the States of full authority over intrastate transportation.

"The act becomes effective October first, but the commission may postpone the effective date of any of its provisions to a time not later than April 1, 1936."

John L. Rogers was born at Knoxville, Tenn., in 1889 and for a time was employed in the mechanical department of the Southern. He later attended the University of Tennessee and George Washington University, receiving the degree of M.E. from the latter. He entered the service of the Interstate Commerce Commission in 1917 as a mechanical engineer in the Bureau of Locomotive Inspection and after studying law at the National University Law School was admitted to the bar. He also studied accounting. In 1925 he became special examiner in the Bureau of Service of the Interstate Commerce Commission and in that position

John L. Rogers

played an active part in investigations by the commission involving refrigeration charges, locomotive equipment, and the six-hour day for railroad employees. In 1933 he was appointed executive assistant to Co-ordinator Eastman.

$35,000 for Liquidation of Railroad Retirement Board

Congress has passed and the President has signed the deficiency appropriation bill including an appropriation of $35,000 for the expenses of the liquidation of the Railroad Retirement Board.

Further Changes in Staff of Co-Ordinator

W. H. Chandler, eastern traffic assistant to the federal co-ordinator of transportation, has resigned, effective on September 1, to return to his former position as traffic director of the Merchants' Association of New York. There is also a vacancy in the office of southern traffic assistant, since the resignation of M. M. Caskie, and C. E. Hochstedler, western traffic assistant, is also acting as principal assistant to C. E. Bell, the co-ordinator's executive and traffic assistant.

Hiawatha Well Patronized

A total of 37,892 passengers, or an average of 592 per day, have been handled on the Hiawatha since its inauguration on May 29 to and including July 31. During July, patronage showed an increase of 101 passengers per day, as compared with June, the daily average for July being 653 and for June, 552. As a result, 20,237 passengers were carried in July, 10,230 northbound and 10,007 southbound. Up to the end of July the train has been on time at terminals every day since May 29 with one exception, when, due to a cloudburst, it arrived in Minneapolis 30 min. late.

Senate Committee Revises Tax Bill

The Senate finance committee has reported a tax bill based on that recently passed by the House but with numerous changes. The Senate bill, like the House bill, provides for a graduated corporation income tax but with rates ranging from 12½ per cent to 15½ per cent, while the House bill graduation was limited to 13¼ to 14¼ per cent. The Senate bill also provides for an excess profits tax ranging from 6 per cent on profits between 10 per cent and 15 per cent of "adjusted declared value," and 12 per cent on profits in excess of 15 per cent. It also provides for a tax on intercorporate dividends and increases the capital stock tax from $1 to $1.50 per $1000 of declared value.

Hearing on Trinity River Project Held at Fort Worth

A hearing on the proposed Trinity River navigation project to provide inland waterway transportation between the Gulf Coast and Fort Worth, Tex., and Dallas was held at Fort Worth before the Board of Engineers for Rivers and Harbors on August 7 and 8. Evidence presented by proponents of the plan related largely to alleged disadvantages as to railway freight rates suffered by Fort Worth and Dallas as compared with Texas gulf ports. The project was opposed by representatives of commercial bodies in Wichita Falls, Amarillo and Abilene, Tex., and by C. B. Bee for the Oklahoma Corporation Commission on behalf of Oklahoma interests, as well as by the railways, which were represented by J. C. Kerr, assistant to vice president, Association of American Railroads; H. D. Cummins, manager, Texas-Louisiana tariff bureau; Col. George A. Knapp, special engineer, Southern Pacific, and T. H. Meeks, assistant superintendent, Southern Pacific Lines. The district and division engineers of the United States War Department have reported unfavorably on this project.

$6,765,197 Allotment for Grade Crossings in Michigan Approved

President Roosevelt has approved an allotment of $6,765,197 of works program funds previously apportioned by the Secretary of Agriculture to Michigan for elimination of hazards at grade crossings in 27 counties in the state. This allotment covers the entire amount earmarked to the state from the $200,000,000 fund set aside for grade crossing projects in the 48 states. The funds are to be applied to the following classes of projects as defined in the approved rules and regulations governing the expenditure of these funds:

Twenty-two projects on the federal-aid highway system outside of municipalities involving reconstruction of one existing grade separation structure, elimination of 14 grade crossings by separation of grades and elimination of 20 grade crossings by 7 highway relocation projects at estimated cost of $2,734,476.

Four projects within municipalities not on extensions of the federal-aid highway system involving reconstruction of three existing grade separation structures and elimination of two grade crossings by construction of one grade separation structure at an estimated cost of $1,022,957.

Ten projects within municipalities on extensions of the federal-aid highway system involving reconstruction of two existing grade separation structures and elimi-

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MAXIMUM POWER

at the "POWER POINTS"

Doubles THE CAPACITY OF THE RAILROAD

Without increasing "permissible weight" on bridges and track, modern locomotives double the capacity of the railroad by applying maximum power at the "Power Points".»»»Doubling the power at the "Power Points" doubles the drawbar horsepower.»»»Doubling the drawbar horsepower doubles the earning capacity of the locomotive, the track and every other railroad facility.

LIMA LOCOMOTIVE WORKS INCORPORATED

LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO

nation of nine grade crossings by construction of eight grade separation structures at an estimated cost of $2,408,184.

Five projects on secondary or feeder roads outside of municipalities involving reconstruction of one existing grade separation structure, elimination of four grade crossings by construction of three grade separation structures and elimination of two grade crossings by one highway relocation project at an estimated cost of $688,637.

Report on Wages and Hours to Be Reissued

Under date of August 1, 1935, Co-ordinator Eastman's office issued a report on the "Extent of Low Wages and Long Hours in the Railroad Industry," prepared by the Section of Labor Relations. The study of low wages was based upon replies received from the Class I railroads covering the payroll period nearest to November 1, 1933. Mr. Eastman has since issued a statement that in preparing this report the rates of pay were treated as *basic* rates rather than the *actual* rates received after the 10 per cent pay reduction in effect at that time. It is now apparent, he says, that the terms "basic" and "actual" were confused and that the rates of pay furnished in response to the questionnaires and used in this report were those actually received by the employees for the payroll period covered in the study. A summary of the report was published in the *Railway Age* of August 3, page 161.

"The general conclusion reached in this report that 155,540 employees, constituting over 15 per cent of total railroad employment, received a rate of 35 cents an hour or less in November, 1933, is not affected by the confusion of 'basic' with 'actual' rates," the statement says. "In reading the text and the tables of this report, however, pending its reissue, it should be clearly understood that all rates of pay are those which were actually received and not basic rates, as stated in the text of the report. The figures in column one of Table 5 of the report are not correct and should be changed as indicated in the attached revision of Table 5 and the statement in the text based on Table 5 modified accordingly. Furthermore, the estimated cost of a minimum wage agreement contained in Part 1, Section V, is incorrect as an estimate of the cost at the present time, but is the correct cost for November, 1933. The cost at present would be less than the figures given in the report.

"The 10 per cent wage deduction in effect at the time this study was undertaken was restored in full by April 1, 1935. This restoration, as well as any other adjustments upwards of wage rates in the lower brackets which may have been made since November, 1933, has reduced the extent of low wages in the railroad industry prevailing in November of 1933. In view of the confusion of terms in the report referred to above, as well as the desirability of noting the improvement to date in the low wage situation, it is deemed advisable to determine the changes in the aggregate which have taken place since November, 1933, combine these findings with the corrected findings of the August 1 report and reissue the report. This will be done as promptly as possible."

Depreciation Accounting Prescribed for Water Carriers

The Interstate Commerce Commission, Division 4, has issued an order requiring all carriers by water subject to the interstate commerce act to institute by January 1, 1937, depreciation accounting in accordance with prescribed regulations, with respect to eight classes of common-carrier property, which the commission in its report finds to be those for which depreciation charges may properly be included under operating expenses. The proceeding was instituted under section 20 (5) of the interstate commerce act, which required the commission to prescribe, as soon as practicable, the classes of property and the percentages of depreciation which shall be charged. The commission found that the same fundamental principles which were decided to be controlling in telephone and railroad depreciation charges are controlling as to water carriers. The classes are: Floating equipment: Line equipment, harbor equipment, and miscellaneous floating equipment. Terminal property: Wharves, docks, and terminals, wharf equipment, general and local office buildings, office equipment, and shops, power plants, and miscellaneous structures.

Illinois Central Train Bombed

An Illinois Central freight train was dynamited three miles south of Springfield, Ill., on August 9, supposedly by disgruntled miners, the locomotive and 11 of the 110 empty cars in the train being lifted from the track. This bombing is another in a long series of destructive acts incident to an inter-union controversy which has waged in southern Illinois coal fields for several years and which has resulted in damage to several trains of the Chicago & Illinois Midland, the Chicago, Burlington & Quincy and the Illinois Central. It is believed that the bombing of the I. C. train, in which the engineman, the fireman and the conductor were injured, was done in error and that the bombers intended to damage a C. & I. M. coal train which passes that point each night but which was preceded on this night by the Illinois Central train.

As a result of the numerous train bombings that have taken place in recent years, the Illinois legislature appropriated $50,000 last June for investigating "the destruction of property and the imperiling of lives." The action on Aug. 9 is the first since that time. The I. C., the C. & I. M. and the Peabody Coal Co. for several months have had standing rewards of $10,000 for the arrest and conviction of the train bombers.

I. C. C. Enjoined in Keystone Spotting Case

The Interstate Commerce Commission has been temporarily enjoined from enforcing its order suspending allowances to the Keystone Steel & Wire Company for car spotting services performed by the company, the injunction being obtained from a three-judge federal court in Peoria on August 13. Under the court's ruling tariffs specifying allowances will continue in force until further order from the court while the injunction will hold until the case has been adjudicated. Judges Page, Briggle and Major composed the court.

A three-judge court at New Orleans on August 19 will hear petitions of seven other industries for stay orders against the Commission's car spotting allowance order. These companies include the Magnolia Petroleum Company, the Humble Oil & Refining Company, the Texas Corporation, and the Gulf Refining Company, whose petitions were filed in Houston last week, and the Pan American Petroleum Company, the Celotex Company and the Great Southern Lumber Company, whose petitions were filed at New Orleans. Co-defendants named with the government include the Illinois Central, the Yazoo & Mississippi Valley, the Texas & Pacific, the Missouri Pacific, the Southern Pacific and other Texas railroads.

Brown Appointed Assistant Chief Inspector of Locomotives

John Brodie Brown, who has been appointed assistant chief inspector of locomotives in the Interstate Commerce Commission's Bureau of Locomotive Inspection, was born May 25, 1881, at Montreal, Canada. After a common school education he took courses in locomotive running and mechanical engineering with the International Correspondence Schools. From October, 1900, to July, 1902, he was a fireman on the Great Northern, from July, 1902, to October, 1905, fireman on the Oregon-Washington, and from October,

Continued on next left-hand page

Table 5—Revised

Estimated Weekly Compensation of Reported Employees and Cumulative Per Cent of Total Employment

Weekly Compensation	Number of Employees: Hourly and Daily Paid	Number of Employees: Weekly and Monthly Paid	Number of Employees: Total	Cumulative Number	Cumulative Per Cent of Total Employment[1]
$7.20 and under	8,210	548	8,758	8,758	.9
Over $7.20 to $9.60	19,301	1,114	20,415	29,173	2.9
" 9.60 to 12.00	31,911	2,970	34,881	64,054	6.3
" 12.00 to 14.40	41,325	8,981	50,306	114,360	11.3
" 14.40 to 16.80	25,198	10,609	35,807	150,167	14.8
" 16.80 to 24.00	4,525	....	4,525	154,692	15.3
Total	130,470	24,222	154,692		
Information lacking for this table	223	625	848	848	
Grand Total	130,693	24,847	155,540	155,540	

[1] Based on 1,014,176 employees, mid-month count for November 1933, from Interstate Commerce Commission, *Wage Statistics*.

1905, to January, 1912, engineer on the same road. On January 16, 1912, he was appointed district inspector of locomotive boilers of the Interstate Commerce Com-

(c) Harris & Ewing
John Brodie Brown

mission, for the district of Oregon and Washington, and he has continued in that capacity until his new appointment as assistant chief inspector.

Social Security Bill Passed

President Roosevelt's social security bill, including plans for pension annuities and unemployment insurance applying to employers generally, with no exemption of railroads, was finally passed by Congress by the adoption of the conference report by both the House and the Senate last week and sent to the President for his signature on August 9. Adoption of the conference report was delayed by a controversy over an amendment to provide some exemption for companies maintaining voluntary pension plans, which was finally rejected. The bill provides for a payroll tax on employers and employees in equal amounts, to produce the funds for the old-age pensions, beginning in 1937 and graduating up to 3 per cent for employers and 3 per cent for employees. There is also an additional tax on employers for unemployment insurance, beginning with 1 per cent for 1936 and ranging up to 3 per cent for 1938.

Meanwhile strenuous efforts are being made by the Railway Labor Executives' Association and its friends in Congress to pass a special railroad pension bill, with the idea of exempting railroads from the provisions of the general bill if it is passed.

A hearing before the House ways and means committee on the tax bill intended to raise the funds for the pension payments was scheduled for Thursday.

July Locomotive Shipments

July shipments of railroad locomotives, as reported by the country's principal manufacturing plants to the United States Department of Commerce, totaled 6 locomotives, as compared with 27 in June and 6 in July, 1934. Unfilled orders at the end of July totaled 43 locomotives, including 15 steam and 28 electric, as compared with unfilled orders for 133 (72 steam and 61 electric) at the close of July, 1934. These figures do not include locomotives built by railroads in their own shops.

I. C. Completes 15-Year Advertising Program

Fifteen years of consistent newspaper advertising devoted to the betterment of its relations with the public was completed by the Illinois Central on August 1, when it released its 180th message. Once a month throughout this period the president has used paid space in on-line newspapers to discuss the problems of his railroad with its patrons in the 14 Mississippi Valley states. The series dates from September, 1920, since which approximately 500 newspapers have been patronized regularly by the railroad throughout its campaign. More than 2,000,000 column inches of space have been purchased at a cost of more than $1,000,000.

Pennsylvania's Private Automobile Service Well Patronized

A total of 4,302 vehicles were shipped by train under the Pennsylvania's passenger ticketing plan during the first six months of 1935, as compared with 1,986 vehicles during the same period last year, an increase of 117 per cent. On the basis of the number of automobiles transported under this plan in the first half of 1935, the P. R. R. estimates that more than 10,000 passengers traveled by train to and from resort centers, both north and south, who would otherwise in all likelihood have made the journey by highway. The ticketing plan permits the holder or holders of two railroad tickets, upon the purchase of an additional ticket, to have an automobile forwarded to destination by expedited freight train service.

Shippers' Views on Freight Containers Sought

Whether freight containers offer a means of providing better transportation service at lower cost is the subject of an inquiry among leading shippers of the country now being set in progress by Joseph B. Eastman, federal co-ordinator of transportation, through his Section of Property and Equipment.

Going directly to the users of transportation, the investigation invites comments on present and possible future uses of freight containers under various plans of operation, and asks what construction features shippers need to enable them to use freight containers efficiently. Emphasizing the importance of the freight container question, Mr. Eastman, in a letter to the traffic managers representing shippers, said:

"As a result of studies of freight traffic which my staff has made during the past two years, with the co-operation of both shippers and carriers, certain means of improving service and operations have been developed which, if they can be put into practice, we believe will be of substantial benefit to you and other shippers and consignees, as well as to the carriers.

"One of the most important of these proposals centers around the general use of containers as a means of carrying a considerable portion of what is now carload traffic, in the form of fractional carload units—perhaps one-fifth, one-fourth or one-half of a carload, or a truck load—and as means also of helping in the co-ordination of the various forms of transportation."

An outline of the container situation, prepared by the Section on Property and Equipment, calls attention to the need for equipment to meet modern shipping requirements. This discussion says in part:

"The development of commerce from a matter of local to one of nationwide distribution involving intercarrier transportation, the growth of hand-to-mouth buying, the demand for fast, frequent service, complete from door to door, and the necessity for eliminating waste in the distribution of goods, call for integrated transportation service and co-ordinated use of different forms of transport, in order to secure maximum speed, safety, and economy in moving goods from 'line of production to point of use.' These objectives can be attained only through provision of physical equipment which will enable the following principal requirements to be met:

(a) Reduce costs of packing, handling, loading, unloading, and storing goods.
(b) Provide shipping units of sizes and designs suited to modern commercial needs.
(c) Avoid breaking bulk in all movements between origin and destination.
(d) Provide maximum security to lading in handling and transportation operations.
(e) Reduce idle time of all forms of transportation equipment.

"Studies made by the Federal Co-ordinator, by transportation agencies, and by industrial and commercial organizations, indicate that correctly designed containers will enable all these requirements to be met, and that their efficient use will result in direct financial benefit to shippers, warehousemen, consignees, and carriers.

"The term 'container' is used to describe a carrying unit in or on which goods may be loaded for shipment by rail, highway, or water, but which is neither a transportation vehicle nor an essential means for packing goods for shipment.

"While no national freight container service has ever been developed, a considerable number of private, local, and regional services have been operated in the United States during the past fifteen years, and in some European countries for a much longer period. The experience gained in operating these services affords ample evidence of savings in many specific operations involved in the movement of goods. Such savings are especially notable in those operations which are non-productive, that is, operations which add to cost but not the value of the goods.

"The development of national container service, and the attainment of maximum usefulness by any local or regional service, have been hampered by several important physical and commercial factors. Lack of generally recognized dimensional standards has prevented interchangeability in use, even with standard railway equipment. Containers have not been adapted to handling a sufficiently wide range of different kinds and quantities of goods. Means for handling containers have not been standardized, and in many cases have

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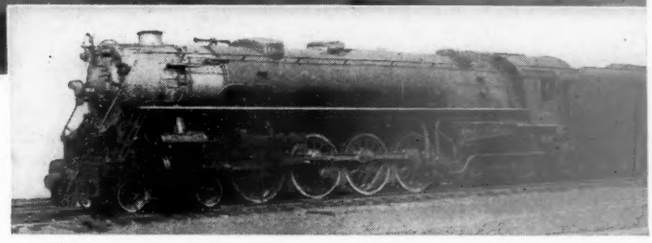
No *Vacation* In the Clouds

for the Exhaust Steam • • •



Modern 4-8-4 type locomotive equipped with an Elesco exhaust steam injector. This high-powered locomotive is designed to handle heavy passenger and fast freight trains on the D., L. & W.

EXHAUST Steam—rich in B. t. u's—is ready to escape up the locomotive stack to infinite freedom among the clouds . . . unless it is sent back to work preheating the boiler feed water.

Used in an Elesco exhaust steam injector, the exhaust steam not only preheats the feed water but injects it into the boiler. This accomplishment is reflected in marked economy in the fuel and water consumption . . . or, if you wish, a substantial increase in the sustained drawbar horsepower for the same fuel and water consumption.

Economize and add power to your locomotives by putting the potent exhaust steam to work through an Elesco exhaust steam injector. More than 20,000 of this type of equipment are in service on railroads throughout the world. Investigate its possibilities on your road.

We have an interesting book that illustrates and describes Elesco exhaust steam injectors—send for your copy today.

THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, INC.

60 East 42nd Street
NEW YORK

ELESCO

Peoples Gas Building
CHICAGO

A-1004

Canada: The Superheater Company, Limited, Montreal

Superheaters • Feed Water Heaters • Exhaust Steam Injectors • Superheated Steam Pyrometers • American Throttles

required expensive special-purpose machinery and equipment. Restriction of container service by any one agency to a relatively small geographic area has had the same effect that would ensue if railroad rolling stock could be used only on the road which owned it.

"In the light of the facts now available, and with the co-operation of all interests concerned in the speedy, safe and economical movement of goods, it appears possible to develop standards of physical equipment, operating methods, and commercial practices which will overcome present handicaps, and enable container service to be used to maximum advantage."

Equipment and Supplies

LOCOMOTIVES

THE ESTRADA DE FERRO DE GOYAZ, Brazil, has ordered one 2-6-6-4 Mallet type locomotive from the Baldwin Locomotive Works. M. Castro Souza is engineer, Araguary, Minas Geraes, Brazil.

FREIGHT CARS

THE ALASKA RAILROAD is inquiring for 10 box cars and 5 insulated heater box cars of 40 tons' capacity.

IRON AND STEEL

THE PITTSBURGH & LAKE ERIE has ordered 900 tons of rail from the Carnegie Steel Company.

THE CHICAGO, BURLINGTON & QUINCY is inquiring for 350 tons of structural steel for bridge work in Nebraska.

THE ILLINOIS CENTRAL has ordered 125 tons of structural steel for repairs to its bridge at Dubuque, Iowa, from the Gage Structural Steel Company.

NEW YORK CENTRAL.—A contract for 500 tons of steel was given to the American Bridge Company for repairing the damage caused by floods to the bridge at Watkins Glen, N. Y.

MISCELLANEOUS

THE VIRGINIA FERRY CORPORATION, a subsidiary of the Pennsylvania Railroad, has ordered from the Sun Shipbuilding & Drydock Company, Chester, Pa., a bay steamer to transport passengers, automobiles and trucks between Cape Charles, Va., and Norfolk.

THE NEW YORK CENTRAL has given a contract to the Electric Storage Battery Company, New York, for the installation of material required to recondition 113 of the cells in the stand-by batteries located in Substation 1-B, Grand Central Terminal, New York City.

Supply Trade

Baldwin Locomotive Works Files Reorganization Plan

The Baldwin Locomotive Works has filed with the United States District Court for the Eastern District of Pennsylvania at Philadelphia, Pa., a plan of reorganization under Section 77B of the federal bankruptcy act. The plan provides for a complete recapitalization of the company and the exchange of all of the securities of the company presently outstanding into new securities authorized by the plan with the exception of the first mortgage bonds, which would be left outstanding in the hands of the public.

The reorganization proposed would result in a substantial reduction of cash disbursements required for fixed charges and in the authorization of securities which might be used to provide for immediate and future capital requirements. Should the plan be accepted, the maximum cash disbursement which the company would be obliged to make until and including September 1, 1940, for interest and sinking fund requirements on its funded debt, exclusive of any payment that may be required with respect to the March 1, 1935, coupon on the consolidated mortgage bonds and of service charges on any new debt incurred, would be the interest on the first mortgage bonds in the hands of the public amounting to $133,800 per annum. This compares with annual fixed charges of $1,281,356, on funded debt as constituted on June 30, 1935.

J. R. C. Hintz has been appointed railway sales division manager, with headquarters at Detroit, Mich., in charge of sales to railways of paints manufactured by **Detroit Graphite Company,** Detroit, and car finishes manufactured by **Valentine & Company,** New York.

The Wrought Washer Manufacturing Company, Milwaukee, Wis., through its Los Angeles sales agents, the **Western Washer & Manufacturing Company,** is expanding its range of service in California and adjacent territory. The latter company has moved into larger quarters at 2111 East Fifty-first street, Los Angeles.

The **A. M. Byers Company,** Pittsburgh, Pa., has expanded its activities to include the manufacture and sale of steel pipe. Several years ago this company completed a modern wrought iron mill at Ambridge, Pa., for manufacturing genuine wrought iron under its new process. Following this, operations were further expanded to include the reintroduction of a wide range of wrought iron products, including plates, sheets, merchant bars, angles, structurals and forging billets. The third step in broadening the sales and manufacturing activities is the manufacture and sale of steel pipe, in addition to its wrought iron pipe.

Braman S. Rockwell was elected executive vice-president of the **Illinois Railway Equipment Company,** Chicago, at a meeting of the board of directors on August 7. He was born in Burlington, Vt., and from 1915 to 1925 was manager of the Illinois Corrugated Metals Company, Springfield, Ill. In the latter year

Braman S. Rockwell

he entered the sales department of the Illinois Railway Equipment Company.

OBITUARY

Leroy A. Williams, vice-president of the Williams-Hayward Varnish Company, Chicago, died in Hartford, Conn., on August 10, where he had been confined in a hospital for the last seven months. He was born in Middletown, Conn., on February 15, 1872, and upon completion of his high school course, he became engaged in

Leroy A. Williams

the carriage manufacturing business. Later he became associated with Flood & Conklin and for 20 years was employed in the railroad and industrial division of that company. He resigned in 1920 to become one of the co-founders of the Williams-Hayward Varnish Company, remaining with that company until his death.

E. E. Boehne, manager of the sales department of the International Creosoting & Construction Co., Galveston, Tex., died suddenly in Denver, Colo., on August 12.

Paul J. Kalman, representative of American Steel Foundries, Chicago, with headquarters at St. Paul, Minn., since

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GOING UP

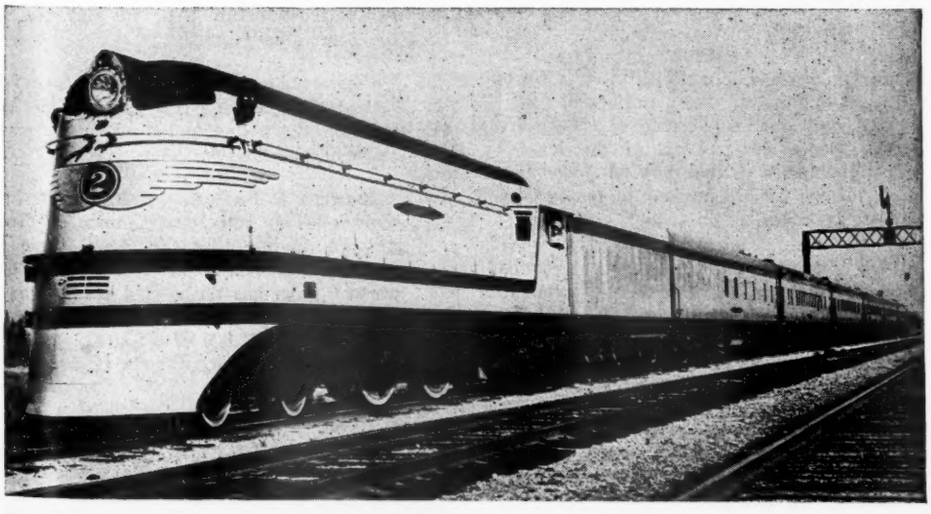
The "Hiawatha" in June carried a total of 16,564 paying passengers, an average of 552 a day.

Total paying passengers carried in July amounted to 20,237, an average of 653 a day.

The locomotive was built to handle six cars on this exacting schedule. On June 15th the train was increased to seven cars — an extra stop is being made at Red Wing — and on August 3rd an eighth car was added.

And the locomotive goes right on making the same original exacting schedule.

AMERICAN LOCOMOTIVE COMPANY



30 CHURCH STREET · NEW YORK · N.Y.

ALCO

1905, and chairman of the Bliss & Laughlin Company, Harvey, Ill., and the Globe Seamless Steel Tube Company, Milwaukee, Wis., died in St. Paul on August 8 after a year's illness. At the time of his death he was also a partner in Harris Upham & Co., New York, and a director of the First Trust Company and the Grand Avenue State Bank at St. Paul. Upon leaving school in 1897, he entered the employ of the Chicago Great Western at St. Paul, and in 1901 organized the Paul J. Kalman Company, St. Paul, which in 1920 became the Kalman Steel Company, which in turn became a subsidiary of the Bethlehem Steel Company in 1931.

Construction

ATCHISON, TOPEKA & SANTA FE.—The Interstate Commerce Commission has modified the authorization issued to this company and the Alton to operate under trackage rights over a short section of the Elgin, Joliet & Eastern and to construct jointly a line in Grundy County, Ill. Under the certificate, as modified, the companies will operate over 1.6 miles of the Elgin, Joliet & Eastern and construct a line 4.2 miles long, instead of operating over 0.7 mile of the E. J. & E. and constructing a line 5.5 miles long, as originally intended.

PORT OF NEW YORK AUTHORITY.—A public hearing will be held on September 10 in the auditorium of the Port Authority building, 111 Eighth avenue, New York, to secure information which may be valuable in determining the exact location and other matters relating to the proposed union railroad freight tunnel under New York harbor from Jersey City, N. J., to Brooklyn, N. Y.

SOUTHEAST.—The construction of the Southeast Railway, extending from Sarabia, Mexico, a station 27 kilometers east of Matias Romero on the Tehuantepec Railway, to the port of Campeche, is now under way. The approximate cost of the road will be from seventy to eighty million pesos, and it is expected that the road will be finished within three years. The National Railways have already sent workers to Ciudad del Carmen, a point midway between the initial point and the terminal, to start roadbed construction immediately and continue the location. The road will have an approximate extension of 800 kilometers and will join the state of Oaxaca with those of Tabasco, Campeche and Yucatan, connecting with the United Railways of Yucatan. The new road will establish land connection with the southeastern states of Mexico, where rubber, cocoa, coffee and bananas are raised. The National Railways of Mexico will have charge of the construction and the Mexican Federal Government and the Governments of the States of Oaxaca, Campeche and Yucatan will finance the project. At present only twenty kilometers of roadbed are contracted for.

Financial

BALTIMORE & OHIO.—*Extension of Operation.*—This company has applied to the Interstate Commerce Commission for authority to extend its operations by construction or reconstruction over a line from Fort Meade Junction to Fort Meade and Odenton, Md., 5.8 miles, where service has recently been discontinued by the abandonment of the Washington, Baltimore & Annapolis electric line.

BATH & HAMMONDSPORT.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Bath, N. Y., to Hammondsport, 9.4 miles.

BOSTON & MAINE.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a three-year extension of its loans amounting to $7,569,431 due September 6.

CHESAPEAKE & OHIO.—*Abandonment.*—The Interstate Commerce Commission has modified its authorization to this company permitting the abandonment of a branch extending from Garrison, Ky., to Gesling, 21.5 miles, to require the continuance in service of the segment between Garrison and Poplar Spur.

CHICAGO & WESTERN INDIANA.—*Bonds.*—The Interstate Commerce Commission has authorized this company to extend from September 1, 1935, to March 1, 1937, the maturity of $512,000 of a $1,000,000 collateral trust note, and to pledge not more than $663,000 of its first and refunding mortgage series A, bonds as collateral security.

ERIE.—*Lease.*—The Interstate Commerce Commission has authorized the extension for a period of 50 years from December 1, 1935, of the lease by this company of the railroad properties of the Long Dock Company in Jersey City, N. J., 2.6 miles.

KANSAS CITY SOUTHERN.—*Acquisition.*—The Interstate Commerce Commission has authorized this company to acquire the entire properties of the Kansas City, Shreveport & Gulf. The latter company will give a deed to the Kansas City Southern for all its properties and in return the K. C. S. will cancel all outstanding stock and bonds of the K. C. S. & G. and also assume all of the latter's outstanding liabilities.

MAINE CENTRAL.—*Refunding.*—A plan for refunding this company's first and refunding mortgage bonds amounting to $20,000,000 which mature on December 1, 1935, and the $3,000,000 six per cent collateral trust bonds, by which holders may take half their present holdings in cash and which will reduce the present fixed charges of the road by about $175,000 per annum, has been approved by the directors. The plan provides that the holder of each $1,000 of either first and refunding mortgage bonds (Series A 4½ per cent, Series B 4½ per cent, Series C 5 per cent, Series D 6 per cent) or 6 per cent collateral trust bonds will be entitled to receive in exchange for such $1,000 bonds:

(a) $500 principal amount in new first mortgage and collateral bonds, Series A sinking fund 4 per cent, due 1945, or, at the option of the bondholder, $500 in cash; and

(b) $500 principal amount in new general mortgage bonds, Series A 4½ per cent, due 1960.

President French stated that the Reconstruction Finance Corporation, subject to the approval of the Interstate Commerce Commission, has agreed to loan the company sufficient funds to enable it to make part payment in cash to those bondholders who may elect to take it, and to repay approximately $2,449,000 which the road at present owes the R. F. C.

Under the proposed plan, which will be submitted in detail to each bondholder, and which must have the approval of the stockholders, the new bonds will retire an equal amount of existing debt.

In the detailed explanation of the proposed plan, which will be sent to bondholders shortly, it is pointed out that Maine Central has made rapid strides forward since 1933. While the road did not earn its fixed charges in 1931 and 1932, the fixed charges were earned by a small margin in 1933 and 1934. "In the first six months of 1935 there was a deficit, after fixed charges, of only $28,473, as compared with a deficit of $303,638 in the first six months of 1934," the statement points out. "If net income for the last half of 1935 equals that for the last half of 1934, net income for the year 1935 obviously will be substantially better than for any one of the past four years."

PENNSYLVANIA.—*Abandonment.*—The Interstate Commerce Commission has authorized the abandonment of 25 miles of short branch lines in Pennsylvania.

PIONEER & FAYETTE.—*R.F.C. Loan Extension.*—The Interstate Commerce Commission, finding that this road is not in need of financial reorganization at the present time, has authorized the extension for six months beyond the July 31 maturity date of $2,000 of a $3,000 loan from the Reconstruction Finance Corporation.

Average Prices of Stocks and of Bonds

	Aug. 13	Last week	Last year
Average price of 20 representative railway stocks..	37.08	35.54	34.58
Average price of 20 representative railway bonds..	74.71	74.36	73.08

Dividends Declared

Bangor & Aroostook.—63c, quarterly; Preferred, $1.75, quarterly, both payable October 1 to holders of record August 31.

Cincinnati, New Orleans & Texas Pacific.—5 Per Cent Preferred, $1.25, quarterly, payable September 3 to holders of record August 15.

Dayton & Michigan.—87½¢, semi-annually; 8 Per Cent Preferred, $1.00, quarterly, both payable October 1 to holders of record September 16.

Union Pacific.—Common, $1.50; Preferred, $2.00, semi-annually, both payable October 1 to holders of record September 4.

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Railway Officers

FINANCIAL, LEGAL AND ACCOUNTING

Guillermo Lopez Espino has been appointed assistant general auditor of the National Railways of Mexico.

OPERATING

Thomas M. Spence, who has been promoted to superintendent of the Dallas and Austin divisions of the Southern Pacific, with headquarters at Ennis, Tex., was born on October 6, 1890, at Evergreen, Ala., and entered railway service on June 21, 1905, as a telegrapher on the Louisville & Nashville. Two years later he became a telegrapher on the Atlantic

Thomas M. Spence

Coast Line and in the same year entered the employ of the Mobile & Ohio in the same capacity. He held this position until November 1, 1910, and from that date until May 1, 1915, served as train dispatcher on various railroads, including the Alabama & Vicksburg at Vicksburg, Miss.; the New Orleans & Northeastern at New Orleans, La.; the St. Louis Southwestern at Tyler, Tex., and the Texas & Pacific at New Orleans, La. He entered the service of the Southern Pacific Lines at Lafayette, La., on May 4, 1915, as a telegrapher and train dispatcher, being promoted to chief dispatcher of the Lafayette division on January 1, 1918. On November 1, 1920, he was appointed trainmaster on the same division at Lafayette, La., which position he held until March 20, 1927, when he was promoted to assistant superintendent of the Dallas division at Ennis, Tex. On January 16, 1928, he was transferred to the Terminals division at Houston, Tex., and on October 1, 1931, to the Victoria division at Victoria, Tex. On March 1, 1934, he was transferred to the Houston division at Houston, Tex., which position he has held until his recent promotion.

Rafael Mora has been appointed superintendent of the Jalapa division of the National Railways of Mexico, with headquarters at Jalapa, Vera Cruz, to succeed **Juan C. Garcia,** who has been transferred to the Torreon division, with headquarters at Torreon, Coahuila. **Juan Mejia,** superintendent of the Queretaro division, with headquarters at Queretaro, Qro., has been appointed superintendent of the Mexico division, with headquarters at Colonia Station, Mexico, D. F., and has been succeeded by **P. G. Pantoja. Alberto M. Bribiesca,** division superintendent, with headquarters at Aguascalientes, Ags., Mex., has been appointed superintendent of the Monterrey division, with headquarters at Monterrey, Nuevo Leon.

TRAFFIC

E. C. Hicks, Jr., assistant to general freight agent of the Atlantic Coast Line, with headquarters at Wilmington, N. C., has been appointed assistant general freight agent, with the same headquarters. **H. V. Borjes** has been appointed assistant general freight agent at Wilmington, N. C.

John W. Hartzell, foreign freight agent of the Baltimore & Ohio, with headquarters at Philadelphia, Pa., has been appointed general foreign freight agent, with headquarters at Baltimore, Md. **James T. Lean** has been appointed foreign freight agent at Philadelphia, Pa., succeeding Mr. Hartzell.

ENGINEERING AND SIGNALING

Manuel Oyarzabal has been appointed division engineer of the Puebla division of the National Railways of Mexico, with headquarters at Puebla, Pue.

MECHANICAL

Sixto Martinez, superintendent of shops of the National Railways of Mexico, with headquarters at Aguascalientes, Ags., Mex., has been promoted to superintendent of motive power and machinery. He was born at Monterrey, Nuevo Leon, on March

Sixto Martinez

28, 1887, and entered railway service on July 1, 1900, as an assistant mechanic for the National Lines at Monterrey. Later he was employed as third class mechanic at Monterrey, second class mechanic at Dona Cecilia and first class mechanic at Monterrey. On December 1, 1907, he was appointed roundhouse foreman at Saltillo, and, after serving as foreman at other roundhouses and repair shops, was appointed master mechanic at Monterrey on September 1, 1914. On February 1, 1919, he was appointed assistant superintendent of motive power and on November 5, 1927, he was appointed superintendent of shops at Aguascalientes, which position he held until his appointment.

OBITUARY

Richard Shakeshaft, general passenger agent of the Atchison, Topeka & Santa Fe at Topeka, Kan., died in that city on August 7.

Frank Cummings Shepherd, consulting engineer of the Boston & Maine, who died on August 6, as reported in the *Railway Age* of August 10, was born at Gloucester, Mass., on December 31, 1870,

Frank C. Shepherd

and was graduated from the Massachusetts Institute of Technology in 1892. Mr. Shepherd first entered railroad engineering work as resident engineer, Grand Central terminal improvements of the New York Central & Hudson River (now New York Central) in 1902. He became construction engineer of the Boston & Maine in April, 1912, and served successively as engineer of construction, valuation engineer, principal assistant engineer, assistant chief engineer, chief constructing engineer, and in April, 1927, he was promoted to consulting engineer. Mr. Shepherd was a member of the American Society of Civil Engineers, the Boston Society of Civil Engineers, chairman of the Committee on Wood Preservation of the American Railway Engineering Association, second vice-president and member of the executive committee of the American Wood Preservers' Association and a past president of the New England Railroad Club.

AN INSPECTION OF THE FACILITIES of the Baltimore & Ohio and the Central of New Jersey at Jersey City, N. J., and Communipaw was recently made by the New York division of the Railroad Enthusiasts, Inc., this being one of a series of similar visits to railroad facilities in the New York area.

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled from 145 Monthly Reports of Revenues and Expenses Representing 149 Class I Steam Railways

FOR THE MONTH OF JUNE, 1935 AND 1934

Item	United States		Eastern District		Southern District		Western District	
	1935	1934	1935	1934	1935	1934	1935	1934
Average number of miles operated	237,801	239,020	58,983	59,071	45,245	45,416	133,573	134,533
Revenues:								
Freight	$225,183,255	$225,709,020	$100,292,393	$97,509,225	$45,625,437	$42,813,682	$79,265,425	$85,386,113
Passenger	31,052,523	31,554,608	17,906,534	18,726,559	3,458,019	3,493,600	9,687,970	9,334,449
Mail	7,395,281	7,331,210	2,829,887	2,854,880	1,286,999	1,276,224	3,278,395	3,200,106
Express	4,381,406	4,958,073	1,593,605	2,297,478	709,885	719,625	2,077,916	1,940,970
All other transportation	6,549,392	6,644,229	3,407,795	3,482,653	571,309	534,806	2,570,288	2,626,770
Incidental	6,144,937	5,996,262	3,148,529	3,241,743	795,779	745,460	2,200,629	2,009,059
Joint facility—Cr.	822,454	805,806	237,073	232,703	218,762	204,374	366,619	368,729
Joint facility—Dr.	193,334	219,714	51,582	52,809	17,704	17,787	124,048	149,118
Railway operating revenues	281,335,914	282,779,494	129,364,234	128,292,432	52,648,486	49,769,984	99,323,194	104,717,078
Expenses:								
Maintenance of way and structures	37,038,903	35,612,345	13,508,014	13,847,135	6,219,476	6,202,354	17,311,413	15,562,856
Maintenance of equipment*	56,047,586	55,449,801	24,803,710	24,997,729	10,429,033	10,657,297	20,814,843	19,794,775
Traffic	8,256,748	7,666,462	3,058,134	2,895,619	1,497,813	1,423,910	3,700,801	3,346,933
Transportation	101,311,621	95,237,751	46,795,216	44,595,063	17,007,670	15,753,922	37,508,735	34,888,766
Miscellaneous operations	2,507,954	2,252,979	1,127,744	1,085,657	265,275	227,923	1,114,935	939,399
General	11,598,768	12,382,300	5,442,592	5,506,990	2,058,685	2,109,378	4,097,491	4,765,932
Transportation for investment—Cr.	297,480	288,390	47,864	68,912	64,115	39,244	185,501	180,234
Railway operating expenses	216,464,100	208,313,248	94,687,546	92,859,281	37,413,837	36,335,540	84,362,717	79,118,427
Net revenue from railway operations	64,871,814	74,466,246	34,676,688	35,433,151	15,234,649	13,434,444	14,960,477	25,598,651
Railway tax accruals	20,586,314	21,166,429	8,905,589	9,002,828	3,995,290	4,028,041	7,685,435	8,135,560
Uncollectible railway revenues	83,774	103,020	40,003	51,762	9,290	17,619	34,481	33,639
Railway operating income	44,201,726	53,196,797	25,731,096	26,378,561	11,230,069	9,388,784	7,240,561	17,429,452
Equipment rents—Dr. balance	7,008,088	8,020,504	3,462,262	4,085,766	345,016	627,490	3,200,810	3,307,248
Joint facility rent—Dr. balance	3,168,947	3,138,535	1,735,980	1,703,224	348,229	411,918	1,084,738	1,023,393
Net railway operating income *a*	34,024,691	42,037,758	20,532,854	20,589,571	10,536,824	8,349,376	2,955,013	13,098,811
Ratio of expenses to revenues (per cent)	76.94	73.67	73.19	72.38	71.06	73.01	84.94	75.55
* Includes:								
Depreciation	15,992,837	15,452,218	7,009,732	6,800,644	3,103,563	2,928,299	5,879,542	5,723,275
Retirements	157,628	446,743	63,072	155,668	34,033	159,164	60,523	131,911
Maintenance of equipment before depreciation and retirements	39,897,121	39,550,840	17,730,906	18,041,417	7,291,437	7,569,834	14,874,778	13,939,589
Net railway operating income before depreciation and retirements	50,175,156	57,936,719	27,605,658	27,545,883	13,674,420	11,436,839	8,895,078	18,953,997

FOR SIX MONTHS ENDED WITH JUNE, 1935 AND 1934

Average number of miles operated	237,977	239,216	58,984	59,107	45,256	45,451	133,737	134,658
Revenues:								
Freight	$1,317,120,008	$1,320,071,391	$586,572,540	$587,018,297	$266,215,520	$268,023,882	$464,331,948	$465,029,212
Passenger	170,797,782	165,191,014	100,325,401	99,859,354	23,856,204	22,425,367	46,616,177	42,906,293
Mail	45,074,754	44,997,875	17,307,953	17,497,320	8,010,523	7,924,045	19,756,278	19,576,510
Express	28,231,021	28,946,951	10,679,257	12,019,939	6,746,133	6,444,417	10,805,631	10,482,595
All other transportation	38,445,634	37,025,035	19,760,221	19,618,367	3,870,960	3,551,351	14,814,453	13,855,317
Incidental	32,422,406	30,381,262	17,365,906	16,706,193	5,132,331	4,646,043	9,924,169	9,029,026
Joint facility—Cr.	4,750,621	4,418,562	1,486,970	1,397,691	1,085,673	1,015,372	2,177,978	2,005,499
Joint facility—Dr.	1,247,907	1,134,989	343,802	303,255	102,264	94,586	801,841	737,148
Railway operating revenues	1,635,594,319	1,629,897,101	753,154,446	753,813,906	314,815,080	313,935,891	567,624,793	562,147,304
Expenses:								
Maintenance of way and structures	183,505,347	179,606,534	70,456,381	72,305,579	36,816,111	35,432,466	76,232,855	71,868,489
Maintenance of equipment†	333,443,620	328,157,803	149,417,401	150,935,381	63,513,920	61,657,376	120,512,299	115,565,046
Traffic	46,992,344	44,159,932	17,554,358	16,617,964	9,073,897	8,432,059	20,364,089	19,109,909
Transportation	612,180,972	575,410,639	285,079,742	275,035,115	104,195,326	97,146,477	222,905,904	203,229,047
Miscellaneous operations	14,701,802	12,880,872	6,906,125	6,425,936	1,968,632	1,658,535	5,827,045	4,796,401
General	70,028,070	73,268,725	32,731,018	32,211,372	12,528,765	12,443,520	24,768,287	28,613,833
Transportation for investment—Cr.	1,389,488	1,197,442	319,088	311,580	202,652	140,201	867,748	745,661
Railway operating expenses	1,259,462,667	1,212,287,063	561,825,937	553,219,767	227,893,999	216,630,232	469,742,731	442,437,064
Net revenue from railway operations	376,131,652	417,610,038	191,328,509	200,594,139	86,921,081	97,305,659	97,882,062	119,710,240
Railway tax accruals	122,037,560	126,751,756	50,527,437	52,192,351	25,519,122	25,660,161	45,991,001	48,899,244
Uncollectible railway revenues	473,048	588,958	191,777	314,416	68,752	95,848	212,519	178,694
Railway operating income	253,621,044	290,269,324	140,609,295	148,087,372	61,333,207	71,549,650	51,678,542	70,632,302
Equipment rents—Dr. balance	40,891,129	45,298,105	20,082,462	22,809,365	2,835,714	4,033,256	17,972,953	18,455,484
Joint facility rent—Dr. balance	17,917,256	18,104,193	10,196,800	9,992,288	1,835,748	2,227,050	5,884,708	5,884,855
Net railway operating income *b*	194,812,659	226,867,026	110,330,033	115,285,719	56,661,745	65,289,344	27,820,881	46,291,963
Ratio of expenses to revenues (per cent)	77.00	74.38	74.60	73.39	72.39	69.00	82.76	78.70
† Includes:								
Depreciation	95,709,630	93,088,724	41,708,955	40,974,906	18,583,149	17,608,669	35,417,526	34,505,149
Retirements	745,780	2,226,169	285,448	687,292	190,331	717,455	270,001	821,422
Maintenance of equipment before depreciation and retirements	236,988,210	232,842,910	107,422,998	109,273,183	44,740,440	43,331,252	84,824,772	80,238,475
Net railway operating income before depreciation and retirements	291,268,069	322,181,919	152,324,436	156,947,917	75,435,225	83,615,468	63,508,408	81,618,534

a The June, 1935, income as reported was increased by credits to operating expenses on account of reversal of charges previously made for liability under the Railroad Retirement Act. These credits amounted to $1,080,089.

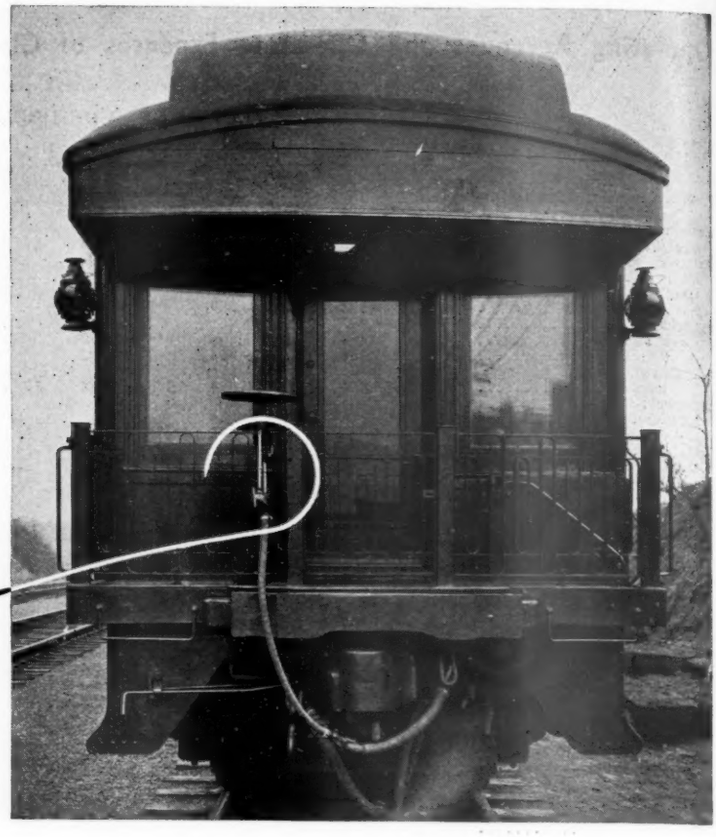
b Income for the 6 months ended with June, 1935, as reported was increased by credits to operating expenses on account of reversal of charges previously made for liability under the Railroad Retirement Act. The net credit was $5,605,911.

d Deficit or other reverse items.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to Revision.

The New Back-Up Valve and Whistle

gives rear-end pilot of a train complete control of back-up movements.



THE valve is easy to operate, and responds readily to intended brake applications of any desired degree, under all atmospheric conditions — far superior to an ordinary cut out cock, often used for the purpose.

The whistle has a pleasing tone of ample carrying capacity, does not interfere with brake control, and consumes little air.

The composite device is light, easily handled, and, by means of the hooked discharge tube, can be hung over the vestibule railing, bringing the brake control handle convenient to the operator's right hand and the whistle button close to the left. . . . Its simple and sturdy construction assures that maintenance will be easy and inexpensive.

(1281)

WESTINGHOUSE AIR BRAKE CO.

GENERAL OFFICE *and* WORKS

WILMERDING, PA.